

Eastern White Pine



Forest Service

U.S. DEPARTMENT OF AGRICULTURE

EASTERN WHITE PINE

(*Pinus strobus*)

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The lumber industry in the United States was founded on eastern white pine—a wood of exceptional all-around usefulness. For more than 250 years it was the leader in the lumber markets. Today the original forests of eastern white pine are mere fragments of what they were, and the bulk of the future supply must come from new growth. It is highly probable that this country will never again see, except in limited quantities, eastern white pine lumber of as high quantity as that cut from trees which had been growing for centuries in our northeastern forests. Eastern white pine frequently grows in mixture with red (Norway) pine and jack pine, and the three have often been cut and sold together as “white pine.”

The existence of eastern white pine, in fact of all the white pines,¹ is seriously threatened by a disease known as the white pine blister rust, brought to this country from Europe about 1900. The spores of this disease develop on currant bushes (*Ribes*), which act as hosts. Only by destroying all of the currant bushes in an infected area is it possible to grow white pine successfully.

In September 1938 a hurricane swept through the New England States causing property damage estimated at millions of dollars. It is estimated that about one-third of the stand of eastern white pine in New England was blown down or damaged. The most serious forest damage occurred in the areas tributary to the Connecticut River—eastern Vermont, western New Hampshire, and north central Massachusetts.

Nomenclature. — Eastern white pine is also known as white pine, northern white pine, northern pine, Weymouth pine, soft pine, and spruce pine. The name “white pine,” however, is much more commonly used than any of the others, but is often also applied to pines whose wood is more or less similar in quality to that of *pinus strobus*.

Distribution and growth. — Eastern white pine grows from Newfoundland to Lake Winnipeg in Canada and southward through the Lake States and the New England States, and the Appalachians as far south as northern Georgia. Figure 1 shows its range in the United States. It grows best in the humid and cool situations common in northern latitudes. Under favorable conditions it reaches heights of 100 or more feet and diameters of 3 to 6 feet. Trees more than 200 feet high have been reported. Extensive stands containing from 25,000 to 50,000 trees to the acre were formerly not uncommon. Eastern white pine in New England grown under favorable conditions averages 1.7 inches in diameter and 7.2 feet in height at 10 years, 8.6 inches in diameter and 61 feet in height at 40 years, and 16.5 inches in diameter and 101 feet in height at 80 years. In the Lake States its growth is somewhat slower.

¹The commercial white pines include eastern white pine (*Pinus strobus*), western white pine (*P. monticola*), and sugar pine (*P. lambertiana*).

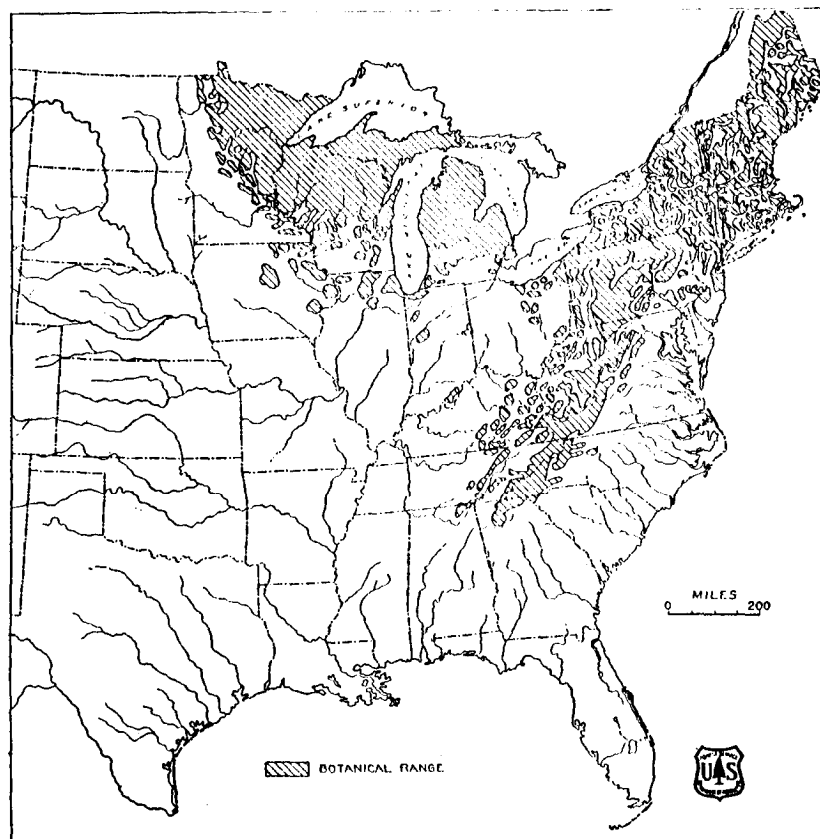


FIGURE 1. —Range of eastern white pine (*Pinus strobus*) in the United States.

Eastern white pine bears cones 5 to 11 inches long that mature and distribute their seeds in the fall of the second year after they are formed. The seeds are equipped with wings and in some cases may be carried half a mile or more by the wind if the parent tree is in an exposed location. Much of the seed, either while in the cone or after it falls to the ground, is consumed by birds and rodents. Seedlings grow best in moist, well-drained sandy or loamy soils protected by vegetation or leaf litter. They require an intermediate amount of light as compared to associated species—more than eastern hemlock or eastern spruce and less than red pine or jack pine. Eastern white pine is a hardy tree and reproduces satisfactorily both naturally and by artificial seeding or planting if protected from blister rust, which is especially destructive to seedlings and young trees.

When trees stand close together in the forest, the lower branches die from lack of light. On eastern white pine trees these dead limbs are often retained for 50 years or more and cause the knots characteristic of lumber cut from comparatively young trees. Such trees furnish practically all of the eastern white pine lumber now produced in the

Northeast. It is only after the dead limbs are broken off by storms, wind, rain or snow are removed by decay, pruning, or other means, that clear wood is formed from which high-grade lumber free from knots can be sawed. A high proportion of such lumber was present in the large trees common in the original forests of eastern white pine.

Supply.—The original stand of eastern white pine in both the United States and Canada has been estimated by the Forest Service at 750 billion board-feet. About 350 billion feet was in the Lake States and 400 billion feet in the Eastern States and Canada. Probably 20 percent of the total was in Canada. An estimate made in 1938 placed the stand of eastern white pine of sawtimber size in the United States at 18,101,000,000 board-feet including approximately 12 billion board-feet in the Northeastern States,² 1 billion board-feet in the southern Appalachian Mountains, and 5 billion board-feet in the Lake States.³

Later estimates based on data from the forest survey (1946-52) and the reappraisal of the forest situation (1945), both conducted by the United States Forest Service, indicate a stand of eastern white pine in the United States of approximately 14,831,000,000 board-feet, distributed as follows:

<i>Region</i>	<i>Stand (Million board-feet)</i>
Lake States:	
Minnesota ¹ -----	1,000
Michigan ¹ -----	700
Wisconsin ¹ -----	700
	2,400
Northeastern States:	
Maine-----	4,043
New Hampshire ¹ -----	2,917
Vermont ¹ -----	598
Massachusetts-----	894
Connecticut-----	84
Rhode Island-----	19
New York-----	1,360
Pennsylvania-----	988
	10,903
Southern Appalachian Mountain States:	
Virginia ¹ -----	407
West Virginia ¹ -----	267
Kentucky ¹ -----	61
Tennessee ¹ -----	244
North Carolina-----	397
South Carolina ¹ -----	18
Georgia-----	136
	1,528
Total stand in the United States-----	14,831

¹ Forest survey 1946-52. Other data from reappraisal of 1945.

Production.—The production of eastern white pine lumber started in New York about 1630 and soon spread to New England and Pennsylvania. For 200 years the pine forests of the Eastern States continued to produce increasing quantities of lumber. By 1840 the original growth in the Northeast was pretty well cut out, and lumbering in the

²This estimate was made before the New England hurricane of 1938, which is reported to have blown down about 2,500,000,000 board-feet of merchantable timber, of which more than 2 billion board-feet was eastern white pine.

³The estimate for the Lake States includes jack pine and red pine.

magnificent pineries of the Lake States was underway. During the next 40 or 50 years the production of lumber in the Lake States increased markedly in volume. In 1889 the total cut of eastern white pine (including some red pine) in the United States reached a maximum of 9,409,000,000 board-feet (fig. 2). Of this total, more than 7 billion board-feet came from Michigan, Wisconsin and Minnesota, and the remainder from 18 other States. Twenty years later (1909)⁴ production had dropped to 3,695,000,000 board-feet.

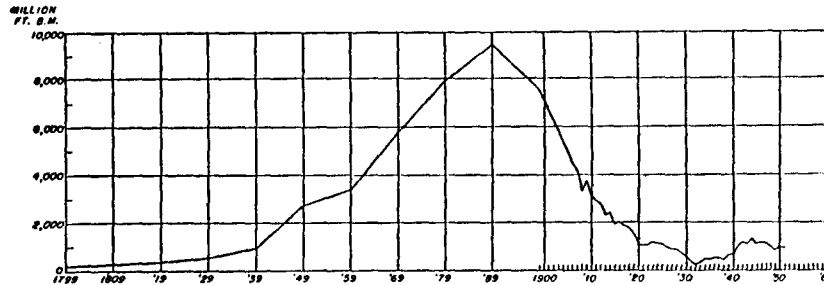


Figure 2.—Lumber production of eastern white pine (*Pinus strobus*), 1799-1951, including comparatively small quantities of red pine (*P. resinosa*) and jack pine (*P. banksiana*).

Since that time production has continued to fall off. In 1932, a year of business depression, it dropped to 198 million board-feet, or approximately one-fiftieth of its maximum in 1889. The shrinkage in production in recent years is even greater than the figures indicate, since the quantities reported as "white pine" in lumber-cut returns from the Lake States include increasing amounts of jack pine and substantial amounts of red pine. Production figures for eastern white pine from other States within its range include only negligible amounts of other species.

The average annual reported cut of eastern white pine for the period 1942-51 was about 1 billion board-feet. This is equivalent to approximately 750 million board-feet after making an allowance for the jack pine and red pine included in the reported figures. The 1944 production reached 1,244,000,000 board-feet—the greatest since 1923. It came from 24 States. The figure for 1944 adjusted to include only eastern white pine would be approximately 930 million board-feet.

The leading States in the production of eastern white pine lumber in 1869⁵ were Wisconsin, Pennsylvania, and New York. A few years later Michigan took the lead and held it for some 25 years during the period when production of eastern white pine lumber was at its peak. Up to 1935 more lumber had been cut from the forests of Michigan, largely during this 25-year period, than from any other State except Washington.⁶ In 1899 Wisconsin again became the leading State in

⁴It was in 1909 that lumber production in the United States, including all species, reached its alltime maximum of approximately 44,500,000,000 board-feet.

⁵Records are not available to show the leading States during an earlier period when lumber operations were centered in New England.

⁶Washington led in total cut and in softwood production, and Michigan led in hardwood production and was second in softwood production.

the production of eastern white pine lumber, with Minnesota and Michigan ranking second and third. In 1904 Minnesota took first place and held it until 1931, when Maine took the lead with New Hampshire second. During the period 1933-46, New Hampshire ranked first in the production of eastern white pine in 8 of the 14 years, and Maine in 6. In 1947 the three leading States were New Hampshire, Maine, and New York. Together they furnished about 60 percent of the cut.

Properties. —The heartwood of eastern white pine is light brown, often with a reddish tinge. It turns considerably darker on exposure. The narrow or medium-wide sapwood is white tinged with yellow. The freshly cut wood has a slightly resinous odor. The growth rings are distinct. They contain a comparatively wide band of light-colored springwood that merges gradually into a narrow band of darker summerwood. The wood has a comparatively uniform texture, is easy to work with tools, has a small shrinkage, is easily kiln-dried, ranks high in ability to stay in place, can be readily glued, and is straight grained. It does not split, rosily in nailing and has an intermediate position in nail-holding ability. Eastern white pine is light in weight,⁷ moderately soft, moderately weak, not stiff, and ranks low in resistance to shock. The wood takes and holds paint, excellently. In ability to resist decay, it has an intermediate rank.⁸

Principal uses. —Practically all of the eastern white pine removed from the forest in logging operations is converted into lumber.⁹ This lumber has probably been put to a greater variety of uses than that of any other wood except oak. Although the field of eastern white pine lumber has been somewhat contracted in recent years because of the diminished supply, it still has a wide range of uses. It can be used satisfactorily for practically every part of a house. Building construction was formerly the outstanding use of eastern white pine. Handsome houses built of eastern white pine in New England some 200 years ago are still in excellent condition. In recent years, however, its place has been taken by other woods.

By far the largest quantity of eastern white pine lumber now goes into boxes for which it is especially suitable on account of its lightness, the ease with which the wood can be worked and stenciled, its nailing properties, and lack of odor. This box lumber is largely second-growth knotty material of the lower grades. Most of the comparatively small amount of high-grade lumber goes into the making of patterns for castings. For this exacting use, eastern white pine has long been and still is a preferred wood because of its uniform texture, fine working properties, small shrinkage, ease of gluing, ability to stay in place, and freedom from resin. High-grade pattern

⁷The average weight of eastern white pine in an air-dry condition (12-percent moisture) is 25 pounds per cubic foot.

⁸This refers to the heartwood. The sapwood of all species is low in resistance to decay.

⁹A small amount of eastern white pine in form of short logs or bolts is cut directly into the short pieces used in making pails and tubs without being first sawed into lumber.

stock consisting of clear, soft, white lumber is sometimes called cork pine or pumpkin pine. Other leading uses are sash, doors, finish, trim, caskets and burial boxes, shade and map rollers, toys, dairy and poultry supplies, and boot and shoe findings. Eastern white pine has lost its place as the leading match wood to western white pine because of the comparative scarcity of material for match planks.

Table 1 shows the amounts of eastern white pine used in the manufacture of wooden products in specified years, 1912-18. The material used in making these products included lumber, veneer, and bolts and logs. Nearly all of it was lumber.

TABLE 1. —*Eastern white pine used in the manufacture of wooden products*

[Thousands of board-feet]

Product	1912	1928	1933	1940	1948
Airplanes.....		47	2	135	4
Agricultural implements.....	8, 243	610	349	143	306
Boot and shoe findings.....		1		3, 926	30, 276
Boxes, cigar and tobacco.....	199	860	1, 011	1, 308	
Butchers' blocks.....	1 200				
Car construction and repair.....	75, 288	9, 040	3, 328	1, 494	2, 344
Caskets and burial boxes.....	32, 969	4, 145	1, 849	10, 356	4, 033
Conduits, pumps, wood pipe.....	14, 374	2, 370	335	3, 009	49
Containers (except cooperage).....	2 1, 120, 990	2 556, 819	337, 549	516, 560	456, 014
Dairy, poultry, and apiary supplies.....	(3)	1, 285	981	4, 654	16
Dowels, skewers, and wedges.....	4 25	4 145			6
Electrical equipment.....	3, 023	6, 120	1, 169	2, 460	142
Fixtures.....	4, 635	1, 146	530	881	11, 443
Flasks.....	(5)	(5)	(5)	(5)	6 14, 344
Flooring.....	(7)	(7)	2, 784	46	2, 737
Furniture.....	10, 113	2, 820	782	3, 716	25, 286
Handles.....	101	20	154	444	2, 001
House trailers.....					8 347
Instruments, musical.....	9, 395	4, 090	77	110	77
Instruments, professional and scientific.....	427	1, 046	49	181	417
Ladders.....	(3)	(3)	536	280	113
Laundry appliances.....	3, 027	4, 572	376		227
Machinery.....	7, 789	201	31	450	2, 083
Matches.....	72, 840	10, 673			
Millwork.....	9 1, 462, 143	9 116, 863	10 13, 537	10 20, 791	10 36, 612
Pallets.....					11 11, 813
Patterns.....	12 17, 746	12 16, 656	18, 402	35, 613	6 27, 876
Plumbers' woodwork.....	786	2			
Prefabricated houses and panels for houses.....					13 6, 434
Prefabricated structures except houses.....					13 229
Printing material.....	12	4	16	3	470
Radios, phonographs, sewing machines.....		50	82	168	932
Refrigerators.....	14 8, 613	14 2, 216	572	802	931
Rollers, shade and map.....	61, 450	14, 024	750	7, 033	6, 663
Ship and boat building.....	13, 929	3, 778	1, 354	2, 988	4, 915
Shuttles, spools, and bobbins.....	130	1, 097		1, 278	302

(See footnotes at end of table.)

TABLE 1. —*Eastern white pine used in the manufacture of wooden products* — Continued

[Thousands of board-feet]

Product	1912	1928	1933	1940	1948
Signs, scenery, displays.....	3, 267	6, 384	1, 615	1, 092	3, 561
Sporting, athletic, playground equipment.....	842	1, 322	26	50	367
Surgical supplies.....					17
Tanks.....	16, 846	298	160	97	6, 140
Toys.....	2, 367	5, 303	3, 725	5, 358	9, 300
Trunks and valises.....	7, 265	957	599	979	818
Vehicles, motor.....	(¹⁵)	712	268	351	526
Vehicles, nonmotor.....	1, 648	147	1	56	194
Venetian blinds.....	(⁷)	(⁷)	(⁷)		935
Woodenware, novelties, and miscellaneous.....	48, 405	4, 376	1, 217	1, 065	7, 019
Total.....	3, 009, 057	780, 196	394, 216	628, 477	878, 319

- ¹ Includes skewers.
² Does not include eastern white pine used for containers by plants not classified as manufacturers of wooden products and that were included in later surveys.
³ Included in "Woodenware, novelties, and miscellaneous."
⁴ Includes dowels only.
⁵ Included in "Patterns."
⁶ Flasks combined with patterns in earlier reports.
⁷ Included in "Millwork."
⁸ Included in "Vehicles, nonmotor" in earlier reports.
⁹ Includes planing-mill products, such as flooring, siding, and ceiling.
¹⁰ Planing-mill products not included.
¹¹ Included in "Containers" in earlier reports.
¹² Does not include eastern white pine used for flasks and patterns by plants not classified as manufacturers of wooden products and that were included in later surveys.
¹³ Included in "Millwork" in earlier reports.
¹⁴ Includes kitchen cabinets.
¹⁵ Included in "Vehicles, nonmotor."

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