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U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE—Circular 97
GIFFORD PINCHOT, Forester

THE TIMBER SUPPLY OF THE UNITED STATES

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THE TIMBER SUPPLY OF THE UNITED STATES.

FOREST PRODUCTS.

The lavish manner in which the United States has consumed the products of its forests and the rapidity with which our timber supply is melting away are wholly unappreciated by those who have never given the matter more than passing consideration. Familiar as all are with the use of wood for every purpose and in every industry, it is only when the various items are added that there begins to come a realization of the indispensable place the forests fill in the national economy. A conservative statement of the present yearly output of the forests is shown below, the values given being those at the point of production:

TABLE 1.—*Annual output of forest products.*

	Quantity.	Value.
Lumber ....board feet..	35,000,000,000	$560,000,000
Firewood..cords..	100,000,000	350,000,000
Shingles and lath...		30,000,000
Hewed cross-ties...	70,000,000	30,000,000
Cooperage stock...		25,000,000
Turpentine and rosin		25,000,000
Pulp wood...cords..	3,000,000	15,000,000
Timber exported (unsawed)...................................		10,000,000
Mine timber, posts, poles, and other products................		30,000,000
Total...		1,075,000,000

The total quantity of wood cut to obtain the products listed in the table was not less than 20 billion cubic feet.

Rapidly as the population of the United States has increased, the lumber consumption has increased still more rapidly. In round numbers, and allowing for incomplete reports, the lumber cut in 1880 was 18 billion feet; in 1890, 24 billion feet, and in 1900, 35 billion feet. The increase in population from 1880 to 1900 was 52 per cent, but in lumber cut 94 per cent. The United States is now using annually 400 board feet of lumber per capita, while the average for Europe is but 60 feet per capita.

Table 2 affords a better understanding of the vast amount of lumber used. This gives the lumber cut of the principal States since 1880. The figures for 1880, 1890, 1900, and 1905 are those compiled by the census; the total cut is estimated by assuming an average cut between census dates. This brings the total cut since 1880 to more than 700 billion feet—a truly astonishing figure when we stop to consider it. This quantity of lumber would make a floor 1 inch thick over Vermont, Massachusetts, Connecticut, Rhode Island, and Delaware, or an area of 25,000 square miles.

TABLE 2.—*Lumber cut of the United States. 1880–1906.*

State.	Reported by census of—				Estimated total cut, 1880–1906.	Per cent.
	1880.	1890.	1900.	1905.		
	M board feet.	*M board feet.*	*M board feet.*	*M board feet.*	*M board feet.*	
Alabama	251,851	586,143	1,096,539	1,243,988	19,625,000	2.8
Arkansas	172,503	526,091	1,595,933	1,680,586	23,932,000	3.4
California	304,795	515,823	734,232	1,077,499	15,789,000	2.2
Colorado	63,792	79,906	133,746	141,914	2,614,000	.4
Connecticut	64,427	48,277	107,594	69,376	1,874,000	.3
Florida	247,627	411,436	788,905	812,693	14,802,000	2.0
Georgia	451,788	572,970	1,308,610	1,135,910	21,865,000	3.1
Idaho	18,204	27,800	65,331	211,447	1,526,000	.2
Illinois	334,244	218,938	381,584	211,545	7,548,000	1.1
Indiana	915,943	707,115	977,878	563,853	21,165,000	3.0
Iowa	412,578	568,816	351,769	281,521	11,410,000	1.6
Kentucky	305,684	420,820	765,343	586,371	13,618,000	1.9
Louisiana	133,472	303,591	1,113,423	2,459,327	19,989,000	2.8
Maine	566,656	564,243	756,515	863,860	17,119,000	2.4
Maryland	123,336	81,078	183,393	166,469	3,394,000	.5
Massachusetts	205,244	208,655	342,058	262,467	6,637,000	.9
Michigan	4,172,572	4,245,717	3,012,057	2,006,670	93,486,000	13.2
Minnesota	563,974	1,079,403	2,341,619	1,942,248	38,174,000	5.4
Mississippi	168,747	452,797	1,202,384	1,727,891	20,173,000	2.9
Missouri	399,744	395,755	715,968	553,940	13,346,000	1.9
Montana	21,420	89,511	255,685	236,430	3,757,000	.5
New Hampshire	292,267	266,890	562,258	491,591	10,103,000	1.4
New Jersey	109,679	32,285	72,660	44,058	1,585,000	.2
New York	1,184,220	909,990	874,754	581,976	28,765,000	3.4
North Carolina	241,822	509,486	1,278,399	1,318,411	20,486,000	2.9
Ohio	910,832	541,076	957,239	420,905	18,886,000	2.7
Oregon	177,171	444,565	734,181	987,107	14,166,000	2.0
Pennsylvania	1,733,844	2,113,267	2,321,284	1,738,972	53,589,000	7.6
South Carolina	185,772	197,940	466,109	609,769	8,466,000	1.2
Tennessee	302,673	450,097	939,463	775,885	15,858,000	2.3
Texas	328,968	839,724	1,230,904	1,406,473	24,109,000	3.4
Vermont	322,942	370,155	365,869	337,238	9,255,000	1.3
Virginia	315,939	409,804	956,169	949,797	16,176,000	2.3
Washington	160,176	1,061,560	1,428,205	2,485,628	30,299,000	4.3
West Virginia	180,112	299,709	773,583	855,889	12,654,000	1.8
Wisconsin	1,542,021	2,817,200	3,361,943	2,623,157	70,647,000	10.0
All others	200,317	126,270	226,977	264,854	4,875,000	.7
Total	18,087,356	23,494,853	34,780,513	34,127,165	706,712,000	100.0

There are some striking things shown in this table. Since 1880 Michigan has produced over 93 billion feet of lumber, or 13.2 per cent of the output of the entire United States; Wisconsin, 70 billion feet, or 10 per cent of the total; Pennsylvania, 53 billion, or 7.6 per cent, and Minnesota 38 billion, or 5.4 per cent. The combined output of these four States since 1880 is almost 256 billion feet, or 36 per cent of the total production of the United States.

No less striking than the increase in output has been the shifting of the sources of supply, as one region has been cut out and another invaded. The percentage of the total lumber cut furnished by the principal regions since 1850, according to census figures, is as follows:

TABLE 3.—*Geographical distribution of total lumber product.*

Year.	Northeastern States.	Lake States.	Southern States.	Pacific States.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*
1850	54.5	6.4	13.8	3.9
1860	36.2	13.6	16.5	6.2
1870	36.8	24.4	9.4	3.8
1880	24.8	33.4	11.9	3.5
1890	18.4	36.3	15.9	7.3
1900	16.0	27.4	25.2	9.6

The Northeastern States reached their relative maximum in 1870 and the Lake States in 1890. The Southern States are undoubtedly near their maximum to-day, with about 35 per cent of the total lumber product, and the time of ascendancy of the Pacific States is rapidly approaching. Since the census of 1900 the product of the Pacific States has risen from less than 10 per cent of the lumber output of the country to 20 per cent. There will be no more shifting after the Pacific States take first place, since there is no new region of virgin timber to turn to.

The shifting of the chief sources of supply has, of course, been accompanied by a change in the kinds of lumber produced. There was a time when white pine alone constituted one-half of the total quantity. In 1900 this species furnished but 21.5 per cent, and in 1904 only 15 per cent of the lumber cut. On the other hand, Douglas fir is credited with 5 per cent in 1900 and 13 per cent in 1905.

FOREST RESOURCES.

The great demand made upon the forests naturally leads to the question: How much timber is now standing in the United States and how long will it last at the present rate of cutting?

The general distribution and character of the original forests of the United States are shown by fig. 1. A glance at this discloses that five groups of States embrace the naturally timbered areas of the country—the Northeastern States, the Southern States, the Lake States, the Rocky Mountain States, and the Pacific States. Of these, the two groups last mentioned are occupied by forests in which practically all the timber-producing trees are coniferous, the first three by both conifers and hardwoods. The earliest attack was upon the white pine of the Northeast, the original stand of which is almost entirely cut out. The present stand in the Northeastern States is mainly spruce, second-growth white pine, hemlock, and hardwoods.

The Southern States produce essentially four types of forest, which may broadly be said to divide the land among them according to elevation above sea level. The swamp forests of the Atlantic and Gulf coasts and the bottom lands of the rivers furnish cypress and hardwoods. The remainder of the coastal plain from Virginia to Texas was originally covered with " southern " or " yellow " pine— the trade name under which the lumber of several pines is now marketed. The plateau which encircles the Appalachian range and the lower parts of the mountain region itself support a pure hardwood forest, while the higher ridges are occupied by conifers— mainly spruce, white pine, and hemlock.

The Lake States still contain much hardwood forest in their southern portions. In the north the coniferous forest includes, besides the rapidly dwindling pine, considerable tamarack, cedar, and hemlock.

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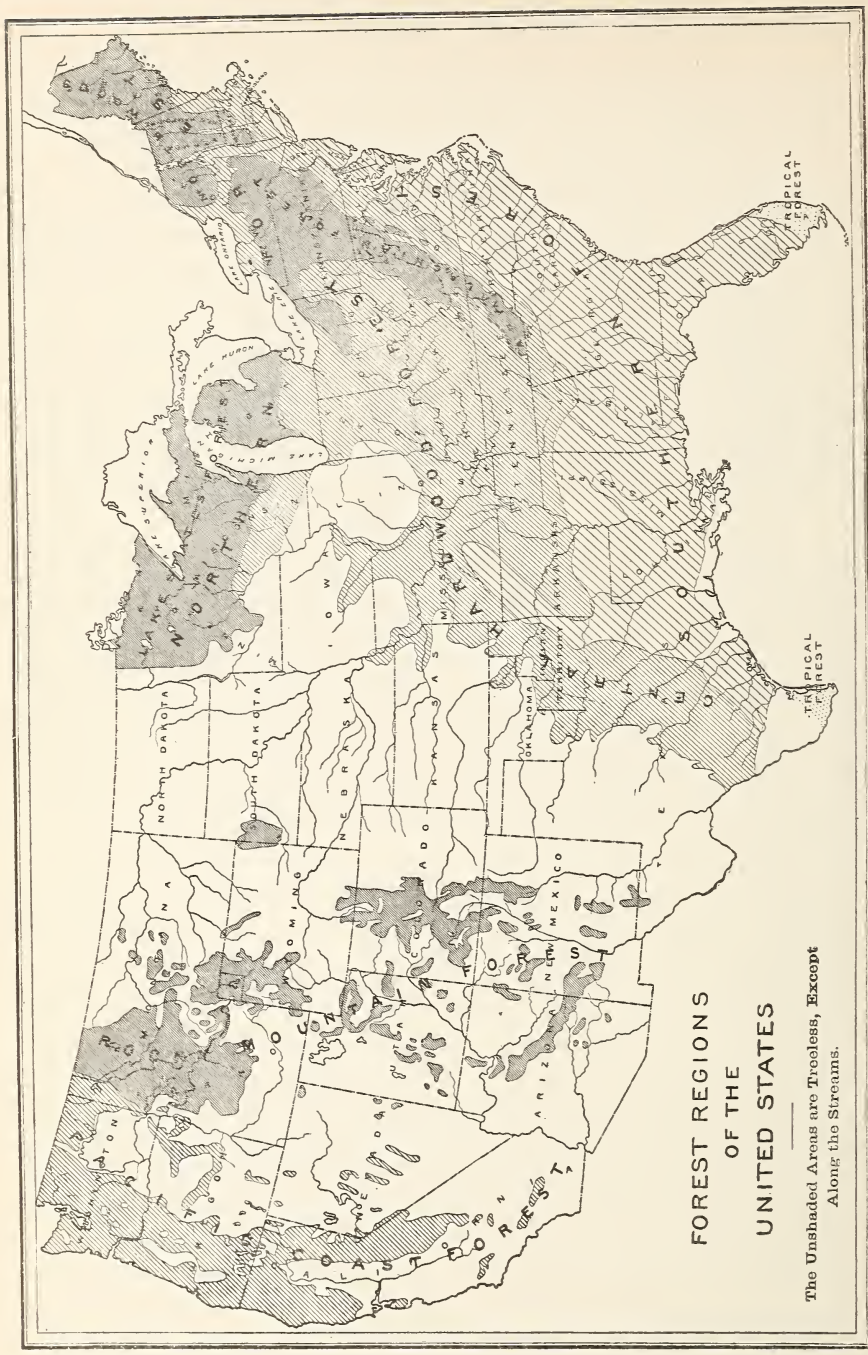
FOREST REGIONS
OF THE
UNITED STATES

The Unshaded Areas are Treeless, **Except**
Along the Streams.

Map showing forest regions of the United States.

[Cir. 97]

The chief timber trees of the Rocky Mountain forest are western yellow and lodgepole pine, while the Pacific forest is rich in the possession of half a dozen leading species—Douglas fir, western hemlock, sugar and western yellow pine, redwood, and cedar.

When an attempt is made to estimate the amount of timber of these various species and regions, the deficiency of our knowledge becomes plain. Various estimates of the stumpage have been made, it is true, but it must be said at the outset that no authoritative estimate can be made at the present time, since the magnitude of the task and the many difficulties involved have hitherto prevented the gathering of the necessary data. Nevertheless, certain general conclusions can be established. In the interest both of the lumber trade and of the public an exact knowledge of the situation which confronts the country is called for, since the lack of such knowledge creates uncertain business conditions and prevents the framing of a rational and comprehensive plan for the best use of our forest resources.

The principal estimates of the stumpage of the United States which have been made since 1880 are given in Table 4. The first is that presented by Sargent in Volume IX of the Tenth Census. This estimate, in addition to being too low for almost every species considered, with the possible exception of the hardwoods, is notable for its omission of the timber which exists to-day in greater quantity than any other—Douglas fir—and also for the omission of western yellow pine, another important species. The next estimate is that of Hotchkiss, published in his "Lumber and Forest History of the Northwest" in 1898. He does not go into details, but simply estimates that the total stumpage is 1,400 billion feet, of which the Northern States have 100 billion, the Southern States 300 billion, and the Pacific States 1,000 billion feet. Next are the estimates prepared by Gannett and published by the Twelfth Census in Bulletin 203. These are the most carefully prepared estimates yet made and have been widely quoted. In addition to bringing the figures for several species up more nearly to the probable stand, these estimates also cover Douglas fir, western yellow pine, and sugar pine, which were omitted in the census of 1880. The next estimate is the one made by Fernow in 1902 and published in his "Economics of Forestry." Like that of Hotchkiss, this is also a regional estimate, the stumpage of the Northern States being placed at 500 billion feet, that of the Southern States at 700 billion, and that of the Western States at 800 billion, a total of 2,000 billion feet and the highest of any given in the table. It may be noted in passing that in a previous estimate published in 1896, in Circular No. 11 of the Division of Forestry, Fernow placed the total stumpage of the country at 2,300

billion feet, which, upon further consideration, he evidently considered too high. At the thirteenth annual meeting of the Southern Lumber Manufacturers' Association, in New Orleans, January, 1903, R. A. Long read a paper upon "Stumpage," in which the figures given in the fifth column of Table 4 were presented. Long's estimate does not cover cypress, sugar pine, or hardwoods. Its principal point of interest is that it differs so radically—about 38 per cent—from that of the census of 1900 upon the stumpage of southern yellow pine. The last estimate given in the table is that published in the American Lumberman September 23, 1905. It is based primarily upon census data, with the addition of some species and with increased figures for others.

TABLE 4.—*Estimates of stumpage of the United States.*

Kind of timber.	Census, 1880.	Hotchkiss, 1898.	Census, 1900.	Fernow, 1902.	Long, 1903.	American Lumberman, 1905.
	M board feet.	M board feet.	M board feet.	M board feet.	M board feet.	M board feet.
White pine	87,755,000	....	50,000,000	....	60,000,000	....
Eastern and northern pine	....	....	....	....	....	55,000,000
Southern yellow pine	237,141,5C0	....	300,000,000	....	187,250,000	300,000,000
Eastern spruce	12,265,000	....	50,000,000	....	18,221,000	75,000,000
Eastern hemlock	20,165,000	....	100,000,000	....	56,571,000	100 000,000
Douglas fir	....	....	300,000,000	....	260,000,000	350,000,000
Western yellow pine	....	....	125,000,000	....	138,000,0C0	250,000,000
Cypress	a2,153,600	....	65,000,000	....	....	65,000,000
Redwood	25,825,000	....	75,000,000	....	75,000,000	75,000,000
Cedar	22,800,000	....	....	....	27,640,000	....
Sugar pine	....	....	25,000,000	....	....	50,000,000
Other conifers	12,500,000	....	....	....	....	250,000,000
Total conifers	420,605,100	....	1,090,C00,000	....	822,682,000	1,570,000,000
Total hardwoods	435,685,000	....	300,000,000	....	....	400,000,000
Region:						
Northern States	....	100,000,000	....	500,000,000	....	....
Southern States	....	300,000,000	....	700,000,000	....	....
Western States	....	....	....	800,000,000	....	....
Pacific States	....	1,000,000,000	....	....	....	....
Total	856,290,100	1,400,000,000	1,390,000,000	2,000,000,000	822,682,000	1,970,000,000

a Florida and Alabama only.

The totals given by the American Lumberman and Fernow are nearly identical; those of Hotchkiss and the census of 1900 differ by 10 million only, and the totals of Long and the census of 1880 would be close together were the omissions in each supplied. It should be remembered, however, in comparing the estimates of 1880 with recent ones that the total cut since 1880 has been over 700 billion feet, of which at least 500 billion feet have been conifers, or 80 billion feet more than the total coniferous stumpage covered by the census of 1880.

The Pacific Lumber Trade Journal, in the issue of January, 1907, gave the following estimate of the stumpage of the Pacific coast, including Idaho, Montana, and British Columbia:

TABLE 5.—*Estimated stumpage of California, Oregon, Washington, Idaho, Montana, and British Columbia.*

Kind of timber.	M board feet.	Kind of timber.	M board feet.
Douglas fir	374,064,102	Spruce	25,419,215
Western and yellow pine	175,586,520	Larch	5,078,601
Red cedar	78,961,383	Miscellaneous and hardwoods	5,700,000
Redwood	75,000,000		
Hemlock	60,848,259	Total	850,658,080
Sugar pine	50,000,000		

This total is credited by States as follows:

	M board feet.
Oregon	225,000,000
Washington	195,658,080
California	180,000,000
British Columbia	150,000,000
Idaho and Montana	100,000,000

KINDS OF TIMBER.

White pine.—The original stand of white pine (including Norway pine) in the Lake States has been estimated at 350 billion feet, and this does not seem excessive when everything is considered. The total cut of pine in the Lake States since lumbering began there some seventy years ago has probably been not less than 250 billion feet, and there have also been huge losses by fire. The census estimate of the stand of white pine in 1880 was less than 88 billion feet; yet, according to the annual reports of the American Lumberman, the cut since that date has exceeded 170 billion, and the amount yet remaining was placed at 50 billion by the census in 1900 and at 60 billion feet by Long in 1903. The estimate in 1880 for Minnesota was especially low—only 8,170 million feet. More than four times that quantity has since been taken out, and Minnesota is to-day furnishing over one-third of the white-pine cut of the United States.

Despite these cheerful statements, however, it is well known that the days of white pine are rapidly passing, and even accepting the most sanguine estimates of the present stumpage it will in a few years cease to be a large factor in the timber supply of the United States. The present annual cut is about 3 billion feet in the Lake States and 1 billion in other States. The total is less than half the cut in the Lake States alone in the latter eighties. At the annual meeting of the Northern Pine Manufacturers' Association in Minneapolis, Minn., January 22, 1907, Secretary J. E. Rhodes made this striking statement:

Since 1895, 248 firms, representing an aggregate annual output of pine lumber of 4¼ billion feet, have retired from business, due to the exhaustion of their timber supply. Plants representing approximately 500 million feet capacity which sawed in 1906 will not be operated in 1907.

Southern yellow pine.—The census of 1880 estimated the stumpage of southern yellow pine at slightly more than 237 billion feet. The cut from 1880 to 1900 must have been in the neighborhood of 100 billion, and the estimate by the census at the latter date was 300 billion feet. Long disagreed with this, however, and estimated the stand at 187 billion in 1903, while the Pacific Lumber Trade Journal in January, 1907, placed the present stumpage, in the opinion of the " best-known timber authorities," at 137 billion feet. This would unquestionably be the case were Long's estimate correct, as the cut since 1903 has been at least 40 billion feet. The census estimate of stumpage of yellow pine in the seven most important States in 1880, Long's in 1903, and the probable cut since 1880 are shown in Table 6. The cut was estimated by assuming the ratio of pine cut to the total lumber cut for each State. The ratio selected is believed to be a conservative one.

TABLE 6.—*Estimated stumpage and cut of yellow pine in seven States.*

State.	Estimated pine stumpage, census 1880.	Estimated pine cut, 1880-1906.	Estimated pine stumpage, Long, 1903.
	M board fee'.	*M board feet.*	*M board feet.*
Alabama	21,345,600	17,500,000	11,250,000
Arkansas	41,315,000	15,500,000	10,5ᴄ0,000
Florida	6,615,000	13,200,000	10,500,000
Georgia	16,778,000	20,100,0ᴄ0	12,000,ᴄ00
Louisiana	48,213,000	16,000,000	45,000,ᴄ00
Mississippi	24,975,0ᴄ0	17,100,000	46,000,0ᴄ0
Texas	67,508,500	22,900,000	30,000,000
Total	226,750,100	122,300,000	165,250,000

The present annual cut of yellow pine is about 12 billion feet, or a little more than one-third the total cut of all species, and the maximum has probably not been reached. Whether we accept the lowest or the highest estimate of stumpage, it is evident that within ten to fifteen years there will be a most serious shortage of yellow pine.

Spruce.—The stumpage of eastern spruce was estimated at something over 12 billion feet by the census of 1880 and at 50 billion by the census of 1900, the total cut during the period perhaps approximating 30 billion feet. Our ignorance of the actual stand of spruce is further shown by the fact that Long's estimate in 1903 was 18 billion feet, while that of the American Lumberman a year and a half later was 75 billion feet. Maine has always been the great spruce-producing State, and lumbering has gone on steadily there for a longer period than anywhere else in the United States. The spruce stumpage of Maine was placed at 5 billion feet by the census of 1880 and at 21 billion by the State forest commission in 1902. In the meantime probably more than twice the quantity estimated in 1880 had been cut. The present annual cut of spruce in the United

States is approximately $1\frac{1}{4}$ billion feet, of which Maine furnishes about one-third.

Hemlock.—The stumpage of eastern hemlock was estimated at 20 billion feet by the census of 1880 and at 100 billion feet by the census of 1900. The present annual cut is approximately 3 billion feet, of which Pennsylvania, Michigan, and Wisconsin furnish about three-fourths. The cut of both eastern spruce and eastern hemlock is decreasing, while that of the western spruce and hemlock is increasing.

Douglas fir.—The stumpage of Douglas fir was estimated at 300 billion feet by the census in 1900 and at 350 billion by the American Lumberman in 1905. The Pacific Lumber Trade Journal, in the article previously referred to, estimates the stand of fir in Washington alone at over 119 billion feet. The cut of Douglas fir reported for the census year 1900 was not quite $1\frac{3}{4}$ billion feet, while the present cut is about $4\frac{1}{2}$ billion feet, with every indication of a rapid increase in the future.

Western yellow pine.—The stand of western yellow pine was estimated at 125 billion feet by the census of 1900, at 138 billion by Long in 1903, and at 250 billion by the American Lumberman in 1905. It is widely scattered and very difficult to estimate. The present annual cut is about 1 billion feet, with two-thirds of the production in the Pacific Coast States.

Redwood.—The redwood stumpage was estimated at less than 26 billion feet by the census of 1880, and at 75 billion by the census of 1900. The annual cut, which is increasing, is now in the neighborhood of 450 million feet.

Cypress.—The stumpage of cypress, for Florida and Alabama only, was estimated at a little over 2 billion feet by the census of 1880. The census of 1900 gave 65 billion feet for all States, as a probable safe figure, and this has been accepted by later estimators. The annual cut is now about three-quarters of a billion feet, with Louisiana supplying approximately 65 per cent of the total.

Hardwoods.—The amount of hardwood stumpage is very indefinitely known, and is determinable only with difficulty, owing to the scattered and uneven stands. It was estimated at some 435 billion feet by the census of 1880, at possibly 300 billion by the census of 1900, and at 400 billion by the American Lumberman in 1905. Whatever the total stumpage may be, that which is fit for the saw is rapidly decreasing. The hardwood cut in 1900 was 8,634,000,000 feet; in 1904, 6,781,000,000 feet. The present annual cut of hardwoods is about 5 billion feet, consisting of approximately 43 per cent oak, 12 per cent poplar, 9 per cent maple, and lesser amounts of numerous other species.

* * * * * * *

Such, in brief, are the leading estimates of our forest resources.

Though a hasty glance at Table 4 might make it appear that the supply of timber is actually increasing, since some of the later estimates are the larger, and in several instances much more timber has been cut from certain regions than was estimated as existing in 1880, this inference would be altogether wrong. Many of the early estimates were based wholly upon inadequate data, and also did not include a great deal of timber that is now considered merchantable. As the timber in any region becomes scarcer the minimum cutting limit is constantly lowered, and timber is taken which was formerly rejected. In New England, for example, 6 inches is now a common cutting diameter for white pine, while in some localities on the Pacific coast nothing below 18 inches is cut.

No one who is at all familiar with the situation doubts for an instant that we are rapidly using up our *forest capital*. In fact, it is unquestionably safe to say that our present annual consumption of wood in all forms is *from three to four times as great as the annual increment of our forests*. Even by accepting the highest estimate of the amount of timber standing we postpone for only a few years the time when there must be a great curtailment in the use of wood if the present methods of forest exploitation are continued. Every indication points to the fact that under present conditions the maximum annual yield of forest products for the country as a whole has been reached, and that in a comparatively short time there will be a marked decrease in the total output, as there is now in several items. Neither is there any great supply of timber to turn to outside of the United States. With the exception of importations of small quantities of high-class woods like mahogany, the only promising source is Canada; but most of the timber there will be required at home. Even now Douglas fir is bringing higher prices in Canadian than in American markets. The course of prices of white pine, yellow poplar, and hemlock since 1887 and of yellow pine since 1894 is shown in fig. 2. The quotations are for the first of each year.

FOREST OWNERSHIP.

In view of conditions which undeniably exist it becomes of the utmost importance that vigorous steps be taken to insure a future supply of timber. The most liberal estimate which has been made of the wooded area of the United States—that of the Geological Survey—place it at 700 million acres, while other careful estimators have placed the forest area as low as 500 million acres. Table 7 gives the wooded area of each State according to the Geological Survey, together with the area of National Forests, or Federal forest reserves, that of State forest reserves, and that of the private or unreserved public forests. The latter item was determined by deducting the area of State or National Forests in each State from the

total wooded area, and in consequence of using this method certain sources of error are introduced. The National Forests in Nebraska and Kansas are not wooded areas, but areas which are more suitable for the production of timber than for ordinary agriculture, and they were set aside for the purpose of forest planting. A considerable amount of open land is included within the boundaries of other
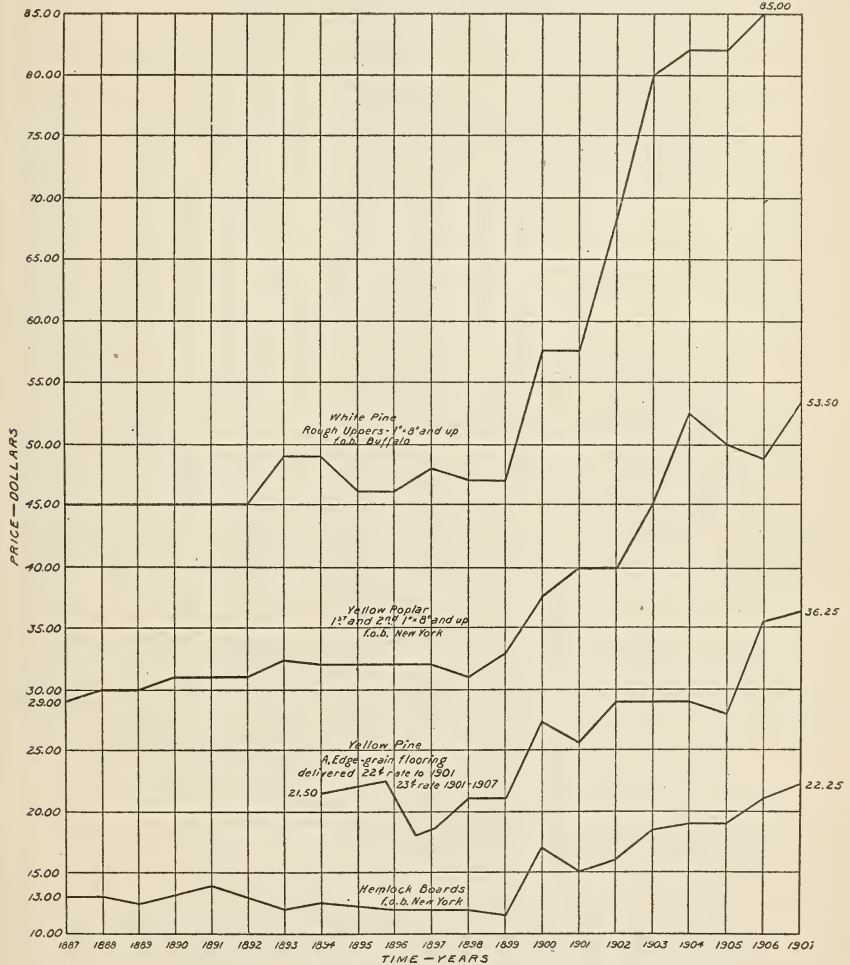

FIG. 2.—Range of lumber prices, 1887 to 1897.

National Forests; and it is probable that in some States the total wooded area is greater than that estimated by the Geological Survey. Thus, while no figures are given for the private and unreserved public forests in Utah and Wyoming there is quite an area of such forests in these States, and more than is indicated in a number of other States.

TABLE 7.—*Forest areas.*

State.	Total wooded area.	National forests.	State forests.	Private and unreserved public forests.
	Acres.	*Acres.*	*Acres.*	*Acres.*
Alabama	24,512,000			24,512,000
Arizona	16,000,000	9,463,725		6,356,275
Arkansas	28,800,000			28,800,000
California	28,608,000	*a* 21,902,931		6,705,069
Colorado	21,440,000	15,748,722		5,691,278
Connecticut	1,216,000		1,360	1,214,640
Delaware	448,000			448,000
Florida	24,128,000			24,128,000
Georgia	26,880,000			26,880,000
Idaho	22,400,000	*a* 20,336,427		2,063,573
Illinois	6,528,000			6,528,000
Indiana	6,912,000		2,000	6,910,000
Indian Territory	12,800,000			12,800,000
Iowa	4,480,000			4,480,000
Kansas	3,648,000	97,280		3,550,720
Kentucky	14,208,000			14,208,000
Louisiana	18,112,000			18,112,000
Maine	15,168,000			15,168,000
Maryland	2,816,000		3,500	2,812,500
Massachusetts	2,688,000			2,688,000
Michigan	24,320,000		39,000	24,281,000
Minnesota	33,408,000		21,000	33,387,000
Mississippi	20,672,000			20,672,000
Missouri	26,240,000			26,240,000
Montana	26,880,000	20,528,263		6,351,737
Nebraska	1,472,000	556,072		915,928
Nevada	3,904,000	*a* 2,348,999		1,555,001
New Hampshire	3,328,000			3,328,000
New Jersey	2,069,760		1,800	2,067,960
New Mexico	15,168,000	*a* 7,337,564		7,830,436
New York	11,968,000		1,439,988	10,528,012
North Carolina	22,592,000			22,592,000
North Dakota	384,000			384,000
Ohio	5,952,000			5,952,000
Oklahoma	2,816,000	60,800		2,755,200
Oregon	34,752,000	*a* 16,463,535		18,288,465
Pennsylvania	14,848,000		820,000	14,028,000
Rho'e Island	256,000			256,000
South Carolina	13,120,000			13,120,000
South Dakota	1,600,000	1,263,720		336,280
Tennessee	17,472,000			17,472,000
Texas	40,960,000			40,960,000
Utah	6,400,000	7,119,472		
Vermont	2,496,000			2,496,000
Virginia	14,976,000			14,976,000
Washington	30,528,000	*a* 12,065,500		18,462,500
West Virginia	11,776,000			11,776,000
Wisconsin	20,320,000		254,063	20,065,937
Wyoming	8,000,000	9,020,475		
Total	700,469,760	144,313,485	2,582,711	554,313,511

a Approximate area.

Total National and State Forests, 146,896,196 acres, equal to 21 per cent of the total wooded area.

Only one-fifth of our forest area is in National or State Forests; four-fifths is either in private hands or likely to pass into private hands. It has been shown that the present annual cut of forest products requires at least 20 billion cubic feet of wood. To produce this quantity of wood without impairing the capital stock our 700 million acres of forest must make an annual increment of 30 cubic feet per acre. Under present conditions of mismanagement and neglect it is safe to say that the average annual increment is less than 10 cubic feet per acre for the entire area. This means that each year's cut at the present rate takes the growth of more than three years.

The average age of the trees which are being felled for lumber this year is not less than 150 years. The lumberman could not afford to replace them were he blessed with the prospect of unequaled longevity, since such long investments are unprofitable for private capital. In consequence there arises the need that the State and National governments, which do not need to look for so high a rate of interest as the private investor and which are concerned with the promotion of the general welfare, should assume the responsibility of providing a future supply of timber.

The forest area of the United States is sufficient, if rightly managed, to produce eventually timber enough to supply every legitimate need. There is no reason why it should not some day be brought up to the point of yielding an annual increment of more than 30 cubic feet per acre, which, as previously said, would supply the quantity of timber now consumed, and which if used economically will be sufficient for a much increased population. The experience of Germany well illustrates the possibilities along this line. The following quotations from an article by Dr. B. E. Fernow, in Forestry and Irrigation for February, 1907, present the case clearly:

One hundred and fifty years ago Germany found herself in very much the same condition as regards her forest resources as we are to-day in the United States—all accessible portions more or less culled, or in poor coppice, burnt over, and damaged by cattle, the valuable virgin timber mostly confined to distant and inaccessible locations. Sporadic attempts existed here and there at protection, at regulation of the cut, at conservative lumbering, and still more sporadic attempts at reforestation.

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Yet until the beginning of the nineteenth century reduction of supplies without adequate reproduction proceeded, and around the year 1800 the wood famine had become acute, giving rise to the same kind of agitation and literature which we have experienced, even to bringing in the catalpa and other such small, rapid growers as the saviors of the nation.

The severity of the timber shortage in Germany at that time was temporarily relieved through increased production of coal and the building of railroads into hitherto inaccessible forest regions. Then came the vigorous organization of extensive forest reserves and the adoption of a settled policy of forest management, based upon the principle of sustained yield, or the cutting of the increment only, without lessening the wood capital. The results of this policy were, in the words of Doctor Fernow, that—

In Saxony the cut increased during the years 1820 to 1890 just 50 per cent, and up to 1904 has increased by another 5 per cent, namely, to 93 cubic feet per acre, the increase through the whole period being at the rate of 0.5 per cent annually.

In Prussia the increase is still more pronounced. While in 1830 the cut was 20 cubic feet per acre, and in 1865 increased to only 24 cubic feet, in 1890 it

was 52, and in 1904 it had grown to 65 cubic feet; forest management had increased the average acre production in seventy-five years more than threefold.

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An acreage of 15,600,000 of German State, municipal, and private forests, lately canvassed, produces an average net revenue of $2.40 per acre annually. In other words, every acre of this property, good, bad, and indifferent, productive and unproductive, represents a capital of $50, paying 5 per cent interest, and this constantly improving.

It must not be overlooked that these results have come largely from non-agricultural lands, the sandy plains, the swamps, the rough mountain slopes, and from forests which in part, at least, were mismanaged like ours.

Can we expect to attain the same or similar results?

We ought to do much better, for we have the hundred years of experience of our friends across the water to draw on, and we can avoid many of the mistakes which they have naturally made and paid for.

Approved:
　　JAMES WILSON,
　　　　　Secretary.
WASHINGTON, D. C., *April 16, 1907.*
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