

THE RISE OF FORESTRY IN THE UNITED STATES.

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Thesis Outline

By

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1. Political history and conditions that have been contended with in this country.
2. Species and distribution of trees in regard to climate and other conditions of environment.
3. Forest conditions, past and present:
 - (a) Geography
 - (b) Policy
 - (c) Statistical information
 - (d) Distribution
 - (e) Composition
 - (f) Protection
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 - (h) Silviculture as practiced
in the past and at the present time.
4. Forest and tariff legislation (Beneficial and injurious).
5. The policy of the United States in regard to lumbering.
6. Establishing and maintaining of government reserves and expenditures.
7. Recent developments in the way of policy and legislation adopted in this country.

From a time practically contemporaneous with the first colonial settlements the problem of forest economics has been recognized and debated in the United States. The first colonial settlements were formed of men of almost every trade and profession, and it was then and there that they struck off into the forests from which they were to hew out their homes. To them the forest was a natural enemy, for they had to clear away the land for raising food producing crops: yet they were directly dependent upon the forest, for it gave to them the material with which to build their homes, for the building of implements, fuel and even in some cases food. It is possible that the history of America would have been reversed to what it is if the location of the forests and treeless plains had been reversed, for with the absence of commerce they could not have endured separation from the forests, which were their only dependence for shelter from the unknown climate of a new country.

The original explorers found the coast a solid woodland practically without a break. They knew not how far inland this extended, but sufficient evidence has since been secured to show that it extended inland for 2000 miles at least. What is now the United States presented an almost solid and continuous forest from the Atlantic Ocean to the Mississippi River, and after an interval of treeless plains came the Mountains with their forest groups and beyond this the almost unlimited forests of the Pacific. A probable estimate of the forest in the United States at that time was at least one-half of the land area. Thus we find that forests stood on millions of acres of valuable fertile land that were needed by the early settler and would-be-farmer for the growing of agricultural crops occupied by a slow growing timber crop. At the start the Colonists, a majority of whom came from countries where the forest supplies were being exhausted, were slow and feared to take any action for the removal of forest growth, but the unlimited supply and the lack of necessity of the products of the forest, the ideas and principles which they had always advocated in the Old World were soon

forgotten, and the new settler was soon a ruthless slayer of the forest. Each, man regardless of what his trade or profession had been now became his own lumberman, and practiced the most extravagant and wasteful methods without consideration for the future. Reforestation appeared to them to be a nonnecessity, and as a result they practiced only methods of deforestation. Even then when all transportation had to be carried on by water or by the wagon road the cutting away of supplies in the immediate vicinity of settlements was a serious matter; the most serious part being that such large amounts were cut and left to flow away on the waterway to clear the land. The valuable timber was treated by them as debris.

There is a popular belief that most of the area which is now open prairie was at that time the site of forests which have been destroyed by fires or other causes, probably the greater portion of which was intentional on the part of the settlers. Much tree growth in the prairieless regions was prevented by the prevalence of prairie fires, but it was soon conceived by some of the foremost educated men of that early time that this extravagance of nature's crop would in time lead to serious results as population increased, and also the lumber industry which at the beginning merely supplied the needs of the individual settler. It was only with this increase in population that the local supply was exhausted and the lumber mills were compelled to go beyond their immediate neighborhood for their supplies and the disposal of their products. Previous to the Twentieth Century the country had been drawing upon a surplus supply, but thereafter a continuance of production of lumber on the former scale without adequate care for the perpetuation or reproduction of the forests would draw upon the capital fund with the result of a scarcity of forest products and a scarcity in the supply. In the supply of standing timber from which to obtain lumber, after three hundred years of wasteful extravagance aided by commerce--especially in the last 100 years, we find great inroads into what was once a continuous forest, after large consumations to the burning log pile which were sent there to clear the land away for crops.

Later the more urgent needs of commerce were drawn upon, until now the last remnants are being attached. Previous to 1870 the census reports give no accurate statements of the amount of standing timber, and all other estimates have been very inaccurate and without exception they have been far too low; probably because of the lack of inclusiveness where many of the small plantations were left out because it was thought they were not of sufficient importance, or that the land holders under-estimated their holdings--either through lack of knowledge or intentionally through a desire to avoid heavy taxes. It is to these under-estimates probably more than any thing else that we may attribute the prolongation of the industry to the present day. The history of the development of lumbering districts showed an over supply, to which we may partly attribute the wasteful use of lumber, and the disposal of the lumber at such low prices that were not warranted by the actual conditions.

Of course the forests that lay in the vicinity of the explorations of the early travelers and settlers came into notice first, and a few of the more conservative men among the wise heads of that early day recognized that to have satisfactory forestry conditions some method must be devised for reforestation. Among these was William Penn. When he placed a provision in the land grant when he disposed of his lands he specified that for every five acres of forest removed one acre should be left to forest, several of the higher officials in the other states soon followed his example.

2. It is not to be supposed that there is a sharp dividing line between forest and prairie, between sections where trees are native and the treeless regions. Some trees require more light than others, some require more moisture, some are not able to endure fluctuations in temperature common to certain regions. All these conditions each alone or combined serve to carry the forests upon incursions for thousands of miles out into the open prairie, or the prairie ^{make} ~~make~~ important openings into what is practically a forested country. Of other influences may be mentioned the soil. There are regions in the soil of which trees

will not grow, but these regions are comparatively few in the United States,--at least soils in which certain species of trees will grow. The upper limit of tree growth on mountain slopes is doubtless affected by the shallowness of the soil, but the primary cause of the lack of growth is temperature, where the mean temperature is at the freezing point or only slightly above, a temperature too low for forest growth to endure or if it succeeds in making a growth only the hardy enduring species survive. Of the above mentioned conditions of environment moisture may be termed the most important factor indetermining the extent and location of forest belts. To these factors we may attribute the division of the country into forest belts. The Atlantic forest being divided into four belts, the largest of which is the Northeastern extending from the northern limit of tree growth down through the United States to Chesapeake Bay. The belt is composed almost entirely of coniferous trees, although here and there intermixed with varieties of hardwoods. The chief woods in this coniferous region are the spruce and pine,--species that are well adapted to the northern climate. The other conifers of this northern coniferous region include the larch, white and black spruce, hemlock, balsam fir and cedar. The next region in point of size is the Eastern belt, and extends from the Chesapeake south to the Gulf. In this southeastern belt the growth is of the coniferous type with a heavy mixture of hardwoods, and is made up of several species of pine, the white and black spruce, red and white cedar, hemlock, larch fir, chestnut, sycamore and honey locust and a species of catalpa (*Catalpa speciosa*). The Central hardwood belt is the great interior section of the eastern forest, although there is no sharp dividing line between it and the eastern coniferous forest but a close approximation of its situation places it south of the northern coniferous belt and west, extending southward down into Alabama, thence westward into Indian Territory--an area including the greater portion of Ohio, Kentucky, Tennessee, Virginia, Indiana and Illinois. The oak with its many varieties is the most important tree, then the black walnut ranks second in importance. A species of per-

haps equal importance is the yellow poplar. Nearly every species of tree of any value to man is found in this region, due to the excellent fertility of the soil and the abundance of moisture. The Southern Coniferous Belt has not been much molested by the early settlers, but within the last thirty years it has been the scene of active lumbering operations as lumber mills have become numerous in the south. This belt extends from Delaware on south including the states bordering along the Atlantic Ocean and the Gulf as far south as Texas, where the forests of the Atlantic and Pacific overlap---and we find the same species in both. This belt extends inland for a width of fifty miles, in places to a width of two or three states. Dr. Fernow in describing the woods of this belt refers to it as being made up of four different pine belts of four different types all running parallel to the coast line. The four most valuable species in these belts being the longleaf pine, the shortleaf pine, the loblolly pine, and the cypress: the most valuable one being the longleaf, or sometimes called the "Pitch pine." Its growth is confined to a belt about a hundred and twenty miles in width extending from Chesapeake Bay to Trinity River in Texas and following the coast. The sap of the longleaf has been the chief basis of the turpentine industry in the southeast. Next in importance in this belt is the southern shortleaf pine, it not being confined to this belt alone. For the most part it grows mixed with hardwoods or with the longleaf or loblolly pine. It was very abundant in Louisiana, Mississippi, Virginia, Texas and Carolina, and together with the longleaf has aided in making these states the important lumber producing states in the union. The loblolly is another tree of importance in this region, it being a very rapid grower, but the sale for it has been handicapped because it decays very rapidly. In the last few years, by the aid of a chemical discovery, a preservative is applied to the wood and its life increased several years. This has caused an increased demand for its lumber, which is often sold under the name of "Short leaf pine," or as short leaf pine itself.

The other great forest division of the United States of the Pacific forest, extending from the Rocky Mountains westward to the Pacific Ocean. The forests of this division are very different from those of the Atlantic division. In the first place the Atlantic forest was originally continuous, or practically so, while the Pacific is much broken. The Pacific is entirely coniferous in its type, while the forests of the Atlantic are of mixed type. The Cascade and Sierra Nevada Mountains divide this division into two great belts running north and south. The eastern belt, which extends to the Rocky Mountains, is an arid country or semi-arid, and types of trees are found there suited to that climate. The trees are distinctly of a mountain type, of a scanty inferior growth. This region is composed of about six states and territories. The forest growth here being largely confined to the mountain ranges and high valleys. The important trees are the spruce, mountain pines, red fir, yellow pine and red cedar. The western belt of the Pacific is further divided into two belts. This division extends between Washington and Oregon. The forests of these two regions are extremely rich and within the last few years have become the great source of lumber supply in the United States, Washington, Oregon and California being the chief lumber producing states, and at one time were practically one solid continuous forest. The principal trees in the northern division of this coastal forest are the cave birch, balsam poplar, trembling aspen, gray pine, larch, balsam fir, and poplar; and in the southern division of this coastal forest we find the true poplar, Alaskan cedar, hemlock, red fir, maple, tideland and Douglas spruce, giant ~~arborescens~~ *vitae*, red cedar and various firs, and in California notably ~~notably~~ the redwood. There are certain species that bind all these areas together. Among these is the western yellow pine, and Englemann spruce, Scattered and broken as are the western forests, the Pacific forests are the greatest remaining timber resource in the United States. Between these two great divisions, the Atlantic and Pacific, is the deciduous leaf tree division. It is somewhat scattered in extent and broken and includes in its types some of the

important lumber producing trees in the United States, such as the oaks, elms, ashes, walnut, locust, cottonwood, osage orange, catalpa and sycamore all thrive here. This belt does not contain any of the very important lumber producing states of the United States.

3. The situation and extent of the forests of the United States have materially changed from the time of colonial settlement to the present. The trend of the forest resources, as has that of the traveler, been ever westward, although the forests were there before the settler arrived awaiting to be exploited by him. The forest geography of that early day presented to them only the Atlantic forest, while later it became separated into the Atlantic and Pacific. The causes making these two divisions so very dissimilar in composition were differences in topography of the two sections, differences in climate and geological conditions; also the altitude and latitude. Later the deciduous leaf tree belt came into notice. After the forest fires had somewhat ceased their devastations this belt began to spring up and be of importance.

In the early history of the United States nothing was thought of a forest policy, for it was thought the supply of timber then standing was inexhaustible, and that the forest was capable of reproducing itself sufficient for their own needs. The early settlers looked upon the forest as a natural enemy and as a menace to agriculture. William Penn and a few other men who had noticed what serious results had happened in the old world from the destruction of the forests, held the interests of the future at heart and tried to formulate some means to prevent this wasteful destruction; but he was premature, as the settlers could not see any alarming conditions ahead. Several of the executive councils in the various colonies tried to establish a simple policy but their efforts in most cases were fruitless. It was not until the supply was nearly exhausted, and the people began to feel the pinch of necessity for the want of this resource that any steps were taken on the part of the government to establish a policy as aids for the encouragement of the forest industry. The government

tried to assist by the passage of the timber culture acts in 1873, and the establishing of an Arbor Day in several of the states, the reduction and refunding of taxes on lands used for forest purposes and finally the establishment of the Bureau of Forestry in connection with the Department of Agriculture, and the establishing of schools for instruction along this line. These have been about the only steps taken toward the formation of a policy in the United States, and these have all been taken since 1870 after the taking of the first forest census. The policy so far established is still weak and in its infancy, but gradually assuming a more definite form as necessity demands it.

The total area of forest in the United States at the time of the early settlements was placed at fifty per cent. of the total land area, or about one-half of 1,900,800,000 acres, while at the present day the forest area is but twenty-six per cent. of the land area in the United States, or about 650,000,000 acres, and only about thirty per cent. of this contains merchantable timber. The present annual forest consumption amounts to 25,000 million cubic feet. This leaves enough forest to satisfy the present rate of consumption for fifty years, but the census reports show an increase of wood consumption in value of at least thirty per cent. for every decade. Fire has been the chief cause of the destruction of the forests. In the states and territories according to the census of 1890 we find 10,274,089 acres destroyed by fire with a value lost of \$25,462,250, and out of the causes 1152 out of 2963 were caused by clearing the land.

Wood used as fuel for various purposes in 1890:

For Domestic purposes,	\$306,950,040
By Railroads	5,126,714
By Steamboats	1,812,083
In Mining Operations	3,548,285
In Manufacture of brick and tile	3,978,331
In Manufacture of salt	121,681
In Manufacture of wool	425,239
Value of saw logs cut was	139,836,869
Returns from Naval Stores industry,	5,000,000
Railroad ties (29,554,694)	9,806,247

The total amount of lumber per capita used was 350 feet. Total amount of wood products used for all purposes, \$490,073,094. Thus we see that the forests have been exploited, and from nothing has sprung up such an enormous industry in exploiting the virgin forests and leaving out of consideration the interests of future generations, For manufacture of vehicles \$155,000,000. For manufacture of furniture \$170,000,000. In 1905 one hundred sixty-seven manufacturers used 212, 613,000 feet of hardwood lumber, 329,186,000 board feet of timber in 1906 were used for veneer, tanbark to the value of \$12,774,071 was used in 1906. Value of poles sold in 1906 was \$9,471, 174.

Of the 600 million acres of forest now in the United States about three-fourths are situated on the eastern side of the continent and the remaining fourth on the western--and scattered promiscuously between the Mississippi River and the Rocky Mountains.

There are fourteen species of oaks in the United States. The following from Difebaugh shows the number of selected coniferous and broad leaved species respectively within the different states in the Atlantic forest:

State	Coniferous	Broad leaved	State	Coniferous	Broad leaved
Maine	11	30	Wisconsin	8	29
New Hampshire	11	30	Minnesota	9	29
Vermont	11	33	Kentucky	6	51
Massachusetts	10	36	Tennessee	8	51
Rhode Island	8	34	Missouri	3	46
Connecticut	8	37	Arkansas	4	48
New York	10	41	Indian Ty.	3	34
New Jersey	7	36	Virginia	9	45
Pennsylvania	8	45	N. Carolina	10	49
Delaware	8	36	S. Carolina	8	41
Maryland	9	45	Georgia	8	44
West Virginia	7	40	Florida	6	43
Ohio	3	47	Alabama	8	44
Indiana	2	48	Mississippi	7	38
Illinois	2	39	Louisiana	5	34
Michigan	9	39	Texas	5	36

The broad leaf is nearly absent in the western part of the United States, and the Pacific belt is entirely coniferous excepting for a slight mixture of broad leaf trees.

The white pine in the north of Michigan, Minnesota, Wisconsin has long been the chief and most important tree in the lumber industry in the United States, but its supply is being rapidly, or is nearly, depleted, and as a substitute in its stead the Douglas spruce of the northwest is coming into prominence.

The long and short leaf pine of the southern states, Texas, Louisiana and Mississippi have held and are still holding a conspicuous place in the lumber producing industry, and are also valuable and contribute much toward the naval stores industry. The loblolly is one of the most abundant trees in the southern forest. In the north the spruce is the important tree. In the north central part of the Atlantic forest belt, from Carolina to Maine, the cypress is the important tree of the forest for the lumberman in Kentucky and on south. The oaks are found more or less in all the forest belts of the Atlantic and Deciduous leaf tree divisions, while it is noticeably absent from the Pacific division, which is entirely coniferous in character. The important trees in this western division are the red fir, cedar, rocky mountain pine, yellow pine, and numerous others of lesser importance.

The forest affords protection in more ways than one, and these ways have generally been overlooked until forest devastation has forcibly presented them to view; especially from what some of the older countries have experienced. In the early history of the United States the forests afforded protection to the settler in the form of shelter to protect him from the wind and rain, and as a roof between him and the beating rays of the sun, but later its importance came into view from the influence which the existence of a forest cover exerted on the condition of the soil in preventing a too rapid evaporation of the water from the soil; the forest litter and debris acts as a mulch, thus improving the mechanical condition of the soil; its effect upon temperature conditions. It is a

well known fact that large bodies of trees have a tempering influence upon the cold winds, and a cooling influence upon hot winds. This is produced by the transpiration of water from the leaves, and by the green leaves deflecting the light. A proof of the value of a forest as a protection to the soil is found when, after deforestation, small gullies where small streams flowed before now become raging torrents with the same amount of rainfall. We know that the influence of the forest is protective, for where it has been removed the winters have become severer, the summers hotter and drier, the rains more often fail, and with a small thunder storm the rivers overflow their banks and are dry the remainder of the year. While the most economic use of the soil for material production necessitates relegation of the forests to the poorer soils, protective considerations relegate it to certain localities.

In the early history of the forests of the United States its products were only utilized for fuel and implements and home building, while the greater portion was not utilized at all, but destroyed. At the present day so general and far reaching has the utility of the forest become that a wood famine would be almost as serious as a bread famine. Our life is dependent upon wood for from the cradle to the coffin wood is used in some form or other. With a reduction in the amount of wood the uses of it have increased many fold, until today it furnishes wood for our homes as it is used more or less in the building of every house. The articles, useful or ornamental, that are made of wood are innumerable. It furnishes us our means of transportation; it furnishes coo-
page to market our vintage, to store our products. One of the latest uses that it has been put to is the manufacture of cellulose and wood pulp. The tanning industry is largely dependent upon the bark of two of our forest trees for the extract tannin. The naval stores industry is confined to the pines of the southern forests: they supply materials for the manufacture of paints, soaps, rubber and paper besides tar pitch and turpentine. The reasons why the uses of wood

have increased are due to the ease with which wood could be obtained and shaped directly for the purpose, its strength, stiffness, elasticity and light weight gives it a value above other materials, the ease with which it could be shaped, its non-conductivity of heat. The most important reason why the uses and varied applications of wood have increased so rapidly have been due to its cheapness, and of course the increased use of wood and utility of the forest have lead to the rapid consumption of the forests.

Silviculture, the pivot upon which the whole forestry business turns, was not practiced at all in the early history of our forests. The lumberman, the first exploiter, treated it as a mine from which he took the best kinds and cuts, abandoning the rest to its fate. The debris that he left furnished food for the forest fires. He repeated this culling process several times until finally all the desirable kinds were removed, leaving the undesirable kinds to struggle with their rivals for the occupancy of the soil. As a result of these operations it was noticed that the present composition of the forest but also the future was deteriorated, and the silviculturist began to treat the forest as a permanent investment and as a crop, keeping in mind the continuity and permanency of the future, and a well developed forestry system resulted where every stick is expected to be utilized and regeneration of another crop is assured for future harvests. The methods of reproduction now practiced are "Artificial" and "Natural." In artificial the whole crop is cleared and removed and again planted with seeds or seedlings. This method is used when an old crop of undesirable kinds is on the ground, or where a forest crop is wished to be started anew. In natural regeneration the forest is left to seed its own area where trees have been removed by seeds falling from trees of the old crop. In this manner of regeneration four methods of management have been used very successfully. The "Group method," where a group of trees have been removed and the border trees left to seed the area where the trees were removed. The "strip method" where a strip of forest is removed at right angles to the prevailing winds, and the

border trees left to seed the area. This method is the most successful with those kinds that have light winged seeds. The "Coppice" method is reproduction from buds forming shoots from the stumps after the old tree is cut. This method is applicable only to the broad leaved trees. The "Nurse tree" method which consists of severe thinnings before a seed crop is expected and the old trees are left to protect the younger trees from the light, wind, etc. The silviculturist as opposed to the lumberman removes the undesirable kinds first, while the lumberman removes the best first.

4. The first forest legislation in the United States was taken with the idea of forest preservation. As early as 1640 New Hampshire tried to regulate the cutting of oaks, and in New Jersey laws against forest fires early appeared on the statute books. The Provincial Assembly of New Hampshire in 1708 forbid under penalty the cutting of large trees on ungranted lands. With the formation of the Republic and the organization of the colonies the thirteen original states adopted laws for the prevention of forest fires. These laws were patterned very much after European models, only they lacked the police system. The distribution of the public domain to the states and to the people at a very low price was legislation that might be considered injurious to the forest industry, as the main object of the settler in filing on these lands was the building of a home, and in order to obtain a living the timber must be removed from the land in order to raise quick return crops. The first historical act considered directly beneficial to forestry was the timber culture act passed in 1873 and amended by further acts up to 1878, and repealed in 1891. The act provided for the planting and growing for eight years of one acre of timber for each sixteen acres of land in a quarter section or less when free patent will issue. Although this act has been repealed there were final entries under this act in 1904 of 7,064,005 acres. There have also been numerous land grants granting land to individuals on to states for purposes of encouraging forestry on the part of the national government. The first suggestion of a policy on the part of the government was in

1876, but the bill failed of passage. The American Forestry Association presented a bill to congress in 1888 providing for the withdrawal from entry or sale of all public timber lands not fit for agricultural purposes and for their proper administration under technical advice. This bill, considerably modified, was passed in 1891, giving the President from time to time right to set apart and reserve in any state or territory having public lands bearing forests any part of the public domain wholly or in part, whether of commercial value or not, as public reservations; and he shall declare the limits thereof by public proclamation. On this authority Presidents Cleveland and Harrison established seventeen forest reservations with a total area of 17,500,000 acres. This area has been more than doubled by proclamations of later Presidents. In 1897 President Cleveland issued a proclamation setting aside 21,379,840 acres upon the recommendation of Secretary Francis of the National Academy of Sciences. This caused a storm in Congress, and the proclamation of 1897 was set aside by Senate Document #102 and a compromise affected by which the reserves hereafter should be controlled. Several stipulations within this act provide for the improvement and protection of the forest, and that the Secretary of the Department of Interior should have direct control of these domains so set aside by the President under these rules and regulations have been formulated for the forest reservations. The appointment of forest superintendents and rangers with technical knowledge to take charge of these reservations marks the beginning of a definite forest policy on the part of the United States government. The establishment of the Forestry Division in the Department of Agriculture has tended to influence forest legislation, although administrative forest legislation has done but little for its encouragement. It is to be hoped that as fears of a wood famine increase and wood prices increase that the government will exercise more legislative function in support of this industry. The tariffs on lumber in the United States have been fixed by political and financial conditions of the government. From 1794 to 1842 the tariffs on lumber were incidentally protective in character, but with the opening of the Erie canal an increased protective duty was laid to offset im-

ports from Canada. The protective tariffs in recent years have been sought and enjoyed by the Pacific coast manufacturers to offset the lumber industry of British Columbia.

5. Lumber production began with the first colonial settlement. Sawmills were located at any point convenient to the demand which they were to supply, providing this point was on some suitable stream, the force of which could be used to furnish the necessary power. As all of the early sawmills were run by water power, thus all the rivers had sawmills on their banks at an early date. This led to the development of the lumber industry in the south at an earlier date than in the north. As the country developed the manufacture of lumber extended along the lines of water transportation where the logs could be drifted or rafted by the current of the larger streams. It is probable that the Dutch and Swedes used sawmills before English occupation, but the first sawmill of record was built at Woodbridge, New Jersey in 1682. Along about 1700 mills began to become more numerous. In 1789 there were nearly 500 sawmills in New Jersey alone and in numbers proportionally in the other states, but in 1810 the number in New Jersey had dwindled down to 56 because of the absence of government restriction in regard to cutting the lumber was of the very best quality and only the best was cut by the logger. Quantity in nearly all cases has been sacrificed for the sake of quality in all of the lumber districts of the United States until recently, when the force of necessity has caused the order to be reversed. The logger heretofore left logs that would now be considered ~~too~~ valuable to rot. This excellent quality of lumber led to a large export trade from this country to foreign countries. This in a short time led to the rapid depletion of the capital fund or lumber logs and the consumption of wood in the industries at a more rapid rate than the increase in population. This led to the lumber being used more and more economically each year, and the amount of waste being diminished; still the destruction of available material is rapidly increasing. It is not at all improbable that if in the early history of our country the government

had adopted and enforced a policy in regard to the size at which logs could be cut and a more careful utilization of the logs, cut, the quantity of lumber would have been maintained at the high yield it was in the early days, and by this we would have a sustained yield equal to our yearly consumption, and the product would not be inferior material as it is today, and the life of the industry would be prolonged beyond what it is today. A few of the states have placed restrictions upon lumbermen,--and wherever this has been done its beneficial effect is beginning to be noticed. The National government has also taken steps along this line but these plans can only be carried out in co-operation with private owners and on the government forest reserves of the national domain. The number of lumbering establishments in 1840 was reported as 31,650, but by the census of 1900 with the increased number of states reporting (which was nearly double that of 1840), the number of sawmills in operation was reported as 33,035, which being a larger number shows a decrease on the whole. The total capital involved in sawmills in 1900 was \$611,611,524, with a value of products of \$566,832,984. Everyone is aware of the fact that our forests are being consumed by lumbermen much faster than they are growing, and that the great lumber producing centers are ever changing and shifting and that this changing has about reached its limit. In 1880 Michigan was the leading lumber producing state in the union, and produced 23 per cent. of our entire lumber output, while in 1906 she was tenth in point of rank, and produced 5.6 per cent. of our lumber. In 1880 Washington held seventh rank and produced nine per cent. of our lumber output, while in 1900 she held first place, producing four and one-half billion board feet in that year. The great question that confronts the American people today is Where will we go for our lumber supplies when the last resorts have been exhausted and the land used for agricultural purposes?

(6) LOCATION, DATE OF LATEST PROCLAMATION, AND AREA OF THE
NATIONAL FORESTS IN THE UNITED STATES, ALASKA, AND PORTO RICO.

According to

Forest Service, United States Department
of Agriculture.

March 1, 1908.

State or Territory	Forest	Date of last Proclamation	Area (Acres)
Arizona	(Baboquivari	Nov. 5, 1906	126,720
	(Black Mesa	July 12, 1907	2,572,249
	(Chiricahua	Nov. 5, 1906	287,520
	(Dragoon	May 25, 1907	69,120
	(Grand Canyon	Aug. 8, 1906	2,257,920
	(Huachuca	Nov. 6, 1906	314,125
	(Mount Graham	July 22, 1902	140,880
	(Prescott	Nov. 26, 1907	743,488
	(San Francisco Mts.	Apr. 12, 1902	1,975,310
	(Santa Catalina	July 19, 1907	406,690
	(Santa Rita	May 27, 1907	490,558
Tonto	(Tonto	Jan. 12, 1908	2,449,280
	(Tumacacori	Nov. 7, 1906	203,550
	(Verde	Dec. 30, 1907	721,780
Arkansas ...	Arkansas	Dec. 18, 1907	1,073,955
California .	(Diamond Mountain	May 27, 1907	649,838
	(Inyo	May 25, 1907	221,324
	(Klamath	May 6, 1905	1,896,313
	(Lassen Peak	Oct. 26, 1907	1,038,996
	(Modoc	Feb. 13, 1908	859,080
	(Monterey	Jan. 9, 1908	360,300
	(Pinnacles	July 18, 1906	14,108
	(Plumas	May 27, 1907	787,742
	(San Benito	Oct. 26, 1907	140,069
	(San Bernardino	Jan. 7, 1908	765,800
	(San Gabriel	Dec. 23, 1907	622,820
	(San Jacinto	Feb. 14, 1907	1,751,439
	(San Luis Obispo	June 25, 1906	363,350
	(Santa Barbara	Oct. 3, 1906	1,982,100
	(Shasta	Sept. 24, 1906	1,523,770
	(Sierra	July 25, 1905	5,049,934
	(Stanislaus	Oct. 26, 1907	1,645,370
	(Stony Creek	Apr. 19, 1907	937,569
	(Tahoe	Sept. 17, 1906	1,394,772
	(Trabuco Canyon	July 6, 1907	153,387
	(Trinity	Feb. 3, 1908	1,593,513
	(Warner Mountains	Nov. 29, 1904	306,518

State or Territory	Forest	Date of latest Proclamation	Area (Acres)
Colorado ...	(Battlement Mesa	June 5, 1905	797,720
	(Cochetopah	June 13, 1905	1,133,330
	(Fruita	Feb. 24, 1906	7,680
	(Gunnison	May 12, 1905	901,270
	(Holy Cross	Mar. 1, 1907	1,061,280
	(La Sal	Jan. 25, 1906	29,502
	(Las Animas	Mar. 1, 1907	196,140
	(Leadville	May 2, 1905	1,219,947
	(Medicine Bow	Sept. 27, 1907	1,346,155
	(Montezuma	Mar. 2, 1907	1,612,146
	(Ouray	Feb. 2, 1907	283,175
	(Park Range	Mar. 1, 1907	1,133,686
	(Pikes Peak	May 12, 1905	1,681,667
	(San Isabel	June 12, 1905	321,227
	(San Juan	Mar. 2, 1907	2,203,918
Idaho.....	(Uncompahgre	Mar. 1, 1907	619,428
	(Wet Mountains	June 12, 1905	239,621
	(White River	May 21, 1904	970,880
	(Bear River	May 28, 1906	415,360
	(Big Hole	Mar. 1, 1907	304,140
	(Bitter Root	May 22, 1905	3,860,960
	(Cabinet	Mar. 2, 1907	494,560
	(Caribou	Jan. 15, 1907	733,000
	(Cassia	June 12, 1905	326,160
	(Coeur d'Alene	Nov. 6, 1906	2,331,280
	(Henrys Lake	May 23, 1905	798,720
	(Kootenai	Nov. 5, 1906	165,242
	(Lemhi	Nov. 5, 1906	1,344,800
	(Palouse	Mar. 2, 1907	194,404
	(Payette	June 3, 1905	1,460,960
Kansas	(Pocatello	Sept. 5, 1903	49,920
	(Port Neuf	Mar. 2, 1907	99,508
	(Priest River	Mar. 2, 1907	815,100
	(Raft River	Nov. 5, 1906	293,044
	(Salmon River	Nov. 5, 1906	1,879,680
	(Sawtooth	Nov. 6, 1906	2,340,160
	(Weiser	Mar. 2, 1907	1,126,429
	(Yellowstone	Mar. 2, 1907	303,000
	(Garden City	July 25, 1905	97,280
Montana....	(Big Belt	Mar. 1, 1907	641,460
	(Big Hole	Mar. 1, 1907	1,612,960
	(Bitter Root	May 22, 1905	691,920
	(Cabinet	Mar. 2, 1907	1,566,400
	(Crazy Mountains	Aug. 10, 1906	234,760
	(Ekalaka	Nov. 5, 1906	33,808
	(Elkhorn	May 12, 1905	186,240
	(Gallatin	Mar. 7, 1906	880,660
	(Helena	Apr. 12, 1906	782,160

State or Territory	Forest	Date of latest Proclamation	Area (Acres)
Montana, con.	(Hell Gate	Sept. 14, 1906	1,582,400
	(Highwood Mountains	Dec. 12, 1903	45,080
	(Kootenai	Nov. 5, 1906	887,360
	(Lewis and Clark	Mar. 2, 1907	5,541,180
	(Little Belt	Feb. 15, 1907	1,053,160
	(Little Rockies	Mar. 2, 1907	31,000
	(Lolo	Nov. 6, 1906	1,211,680
	(Long Pine	Sept. 24, 1906	111,445
	(Madison	Oct. 3, 1905	958,800
	(Missoula	Nov. 6, 1906	194,430
	(Otter	Mar. 2, 1907	590,720
	(Pryor Mountains	June 1, 1907	78,733
	(Snowy Mountains	Nov. 5, 1906	126,080
	(Yellowstone	Mar. 2, 1907	1,352,240
Nebraska ...	(Dismal River	Apr. 16, 1902	85,123
	(Niobrara	Apr. 16, 1902	123,779
	(North Platte	Mar. 10, 1906	347,170
Nevada.....	(Charleston	Nov. 5, 1906	149,165
	(Independence	Nov. 5, 1906	135,019
	(Monitor	Apr. 15, 1907	572,640
	(Ruby Mountains	May 3, 1906	423,660
	(Tahoe	Sept. 17, 1906	59,115
	(Toiyabe	Mar. 1, 1907	625,040
	(Toiyabe	Apr. 15, 1907	368,000
	(Vegas	Dec. 12, 1907	195,840
New Mexico..	(Big Burros	Apr. 6, 1907	156,780
	(Gallinas	Apr. 15, 1907	78,480
	(Gila	July 21, 1905	2,823,900
	(Guadalupe	Apr. 19, 1907	283,065
	(Jemez	Nov. 7, 1906	1,460,245
	(Lincoln	Apr. 24, 1907	627,435
	(Las Animas	Mar. 1, 1907	480
	(Magdalena	June 6, 1907	153,782
	(Manzano	Nov. 6, 1906	459,726
	(Mount Taylor	Oct. 5, 1906	110,525
	(Pecos River	May 27, 1898	430,880
	(Pelonicillo	Nov. 5, 1906	178,977
	(Sacramento	Apr. 24, 1907	881,841
	(San Mateo	Nov. 5, 1906	424,663
	(Taos	Nov. 7, 1906	233,300
Oklahoma	Wichita	May 29, 1906	60,800

State or Territory	Forest	Date of latest Proclamation	Area (Acres)
Oregon.....	(Ashland	Mar. 2, 1907	172,800
	(Blue Mountains	Jan. 9, 1908	3,472,277
	(Bull Run	Jan. 17, 1892	142,080
	(Cascade	Mar. 2, 1907	5,886,840
	(Coquille	Mar. 2, 1907	148,317
	(Fremont	Sept. 17, 1906	1,235,720
	(Goose Lake	Aug. 21, 1906	630,000
	(Heppner	July 18, 1906	292,186
	(Imnaha	Mar. 1, 1907	1,750,240
	(Siskiyou	Mar. 1, 1907	1,132,582
	(Tillamook	Mar. 2, 1907	175,518
	(Empqua	Mar. 2, 1907	798,400
	(Wenaha	Mar. 1, 1907	494,942
South Dakota	(Black Hills	Sept 19, 1898	1,163,160
	(Cave Hills	Mar. 5, 1904	23,360
	(Short Pine	July 22, 1905	19,040
	(Slim Buttes	Mar. 5, 1904	58,160
Utah.....	(Aquarius	Dec. 13, 1907	726,159
	(Bear River	May 28, 1906	267,920
	(Beaver	Apr. 25, 1907	286,669
	(Dixie	Sept 25, 1905	465,920
	(Fillmore	May 19, 1906	399,600
	(Fish Lake	Apr. 29, 1907	363,337
	(Glenwood	Feb. 6, 1907	173,896
	(Grantsville	May 7, 1904	68,960
	(La Sal	Jan 25, 1906	128,960
	(Manti	Apr. 25, 1907	786,080
	(Monticello	Dec. 12, 1907	315,668
	(Payson	July 21, 1905	167,280
	(Raft River	Nov. 5, 1906	117,203
	(Salt Lake	May 26, 1904	95,440
	(Sevier	Jan. 17, 1906	710,920
	(Uinta	Oct. 6, 1906	2,187,550
	(Vernon	Apr. 24, 1906	68,800
	(Wasatch	Aug. 16, 1906	85,400
Washington..	(Colville	Mar. 1, 1907	869,520
	(Olympic	Mar. 2, 1907	1,594,560
	(Priest River	Mar. 2, 1907	406,520
	(Rainier	Mar. 2, 1907	2,565,760
	(Washington	Mar. 2, 1907	6,310,740
	(Wenaha	Mar. 1, 1907	318,400

State or Territory	Forests	Date of latest Proclamation	Area (Acres)
Wyoming.....	(Bear Lodge	Mar. 1, 1907	136,784
	(Big Horn	Dec. 23, 1904	1,151,680
	(Black Hills	Sept. 19, 1898	46,440
	(Caribou	Jan. 15, 1907	7,740
	(Crow Creek	Oct. 10, 1900	56,320
	(Medicine Bow	Sept. 27, 1907	561,612
	(Sierra Madre	Nov. 5, 1906	270,911
	(Uinta	Oct. 6, 1906	4,596
	(Yellowstone	Mar. 2, 1907	<u>6,662,640</u>
Total of 159 Forests in the United States			152,001,347
Alaska.....	(Alaska	Dec. 24, 1892	403,640
	(Alexander Archipelago	July 20, 1907	4,494,362
	(Chugach	Sept. 18, 1907	4,927,000
	(Tongass	Sept. 10, 1907	2,262,624
Total -----			12,087,626
Porto Rico	Luquillo	Jan. 17, 1903	<u><u>65,950</u></u>
Grand Total of 164 National Forests-----			164,154,923

(7) Recent Developments in Policy & Legislation Adopted in this Country.

It was not until recent years that any decided effort was made on the part of the government in the way of establishing a policy and formulating legislation in the interests of national forestry. In nearly every portion of the United States a point has been reached where the development of the country is made with the forest as an essential aid. The Timber and Stone Act of 1878 proved ineffective as it tended strongly to the segregation of large holdings of timber lands for speculative purposes. The act of March, 1891 gave the President power to set aside lands for forest reserves but did not provide for their administration. They were thereby *worthless* and were of no use. The act of 1897 enlarged the powers of the President and provided for a protective force. In February 1905 the administration of the national forests were transferred to the Department of Agriculture, and a policy of the greatest use to the forests was adopted. Under these enlarged powers of the Secretary regulations governing the cutting of timber have been greatly simplified, and annoying delays in the transaction of business wiped out. The government has been forced into the forestry business because it is the duty of the government to see that necessary products may be guaranteed for future generations.

Some of the important points in the management of forests according to the present policy is the use of more men on the protective force. No live timber is to be cut in the forests until it is determined by careful study that lumbering will not injure the forest. The remaining supply of timber must be used with the utmost economy, and in every case reproduction must be absolutely assured. Waste ~~is~~ logging is prevented by rules framed to apply to the particular class of timber to be cut. As a protection against fire all brush must be burned, and if necessary logging must be stopped. When it is very dry seed trees must be left whenever necessary to insure a second crop.

Another definite step in the matter of policy is the appeal of the President to Congress in his message for the preservation of our national re-

sources, and the lead taken by the various states. The Ohio Republican platform contained a plank advocating the preservation of our forests, also the Democratic platform of Nebraska contained a plank urging the preservation of the forests still remaining and more liberal appropriations for the improvement and development of the same. The American Forestry Association is doing a great work both in agitating the matter of protecting the forests and in encouraging the growth of timber. This has had the effect of interesting the lumbermen and they, acting in conjunction with others, are preventing forest destruction. Many people think that forestry cannot be practiced in this country, yet it is practiced in every civilized country in the world,--then this country ought to make and is making rapid progress in the last few years along this line,--for it would be no experiment on our part as we would have all the experience gained by them to go on and could begin where they left off and thereby make greater strides.

If the appreciation of forests and forestry is to become general public interest must be aroused, and as the force of necessity brings this home strongly greater interest is being taken. The one best way probably is the educating of the public school children and through them their parents. Every child in the land should be compelled to commit and learn to practice the words of the poet, "What do we Plant when we Plant the Tree;" and "Woodman, Woodman, Spare that Tree."