MARYLAND STATE BOARD OF FORESTRY

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Executive Officer.

F. W. BESLEY,
State Forester.

THE FORESTS OF MARYLAND

BY

F. W. BESLEY, STATE FORESTER

BALTIMORE, MARYLAND
December, 1916

PLATE I.—SWALLOW FALLS.

THE FORESTS OF MARYLAND

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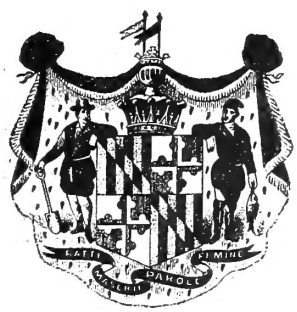

BALTIMORE, MARYLAND
December, 1916

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STATE FORESTER'S OFFICE

BALTIMORE, MARYLAND.

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INTRODUCTION.

The Maryland State Board of Forestry was created in 1906 by special legislative Act. Its first, and then most important, task was to accurately ascertain the forest conditions and forest needs of Maryland.

To this end a Forest Survey of counties was begun in 1907, though with the limited funds at the disposal of the Board it required until the summer of 1914 for its completion. The Survey gave an accurate and complete inventory of the forest resources and furnished a large amount of additional data from which this Report has in large part been prepared. The county forest maps—a separate one for each county showing the character and extent of forest areas, with the approximate stand of timber — are each found with the descriptions of the respective counties. The original maps, on a scale of one mile to the inch, are reduced to a scale of three miles to the inch for this publication, but in the case of Allegany, Anne Arundel, Baltimore, Frederick, Garrett, Kent, Prince George's, Washington, and Worcester counties maps on the larger scale have already been published.

It is the purpose of this Report to show in condensed form and orderly manner our present forest resources, their value to the people of the State, and how these resources may best be conserved by wise use, not only to supply present needs but to anticipate the needs of the future. The methods used in making the Forest Survey, with material secured, and manner of its presentation, have all been developed along original lines to supply as far as practicable information likely to be of greatest value to the various users of the forest.

The forest owner, whether he has but a ten-acre woodlot or possesses thousands of acres of forest land, wants to know how to handle his land for timber production, what products are the most valuable and how he can best protect, harvest, and market his timber crop. The timber buyer wants to know where he can find timber of suitable kind advantageously located. An examination of the various county forest maps will show him where the woodlands are located, their kinds, and indicate the stand of timber supplemented by the forest descriptions of each county. The wood user or manufacturer wants to know of sources of supply to help maintain his business or

industry. Here again the forest maps, supplemented by the summary of timber products for each county, should serve to indicate local production. For the statistician and student of economy much will be found of value. And finally, every one interested in the natural resources of Maryland will find in the descriptions, maps, and tables accurate information concerning them.

All these should find in this Report upon THE FORESTS OF MARYLAND, with its supplement of county maps and county timber data, location of woodlands, their kinds, amounts, and range of forest products, an answer to their questions, assistance in the solution of local forest problems, and an incentive to a study of the forests. In their value of natural products the forest resources of Maryland rank second only to agriculture. It is intended that this Report should be a hand-book of Maryland's forests, supplying information which has heretofore been inaccessible regarding these great natural resources of the State.

THE FORESTS OF MARYLAND.

Maryland occupies a central position on the Atlantic Seaboard, and with its exceptional inland waterways possesses a location of great advantage in a commercial sense. Its natural resources of soil, mine, forest and water all contribute to its supremacy. There is probably no State in the Union which, on an equal area, has such a diversity of products and conditions. In land area Maryland ranks forty-first, and twenty-seventh in population among the continental United States.

Traversing the extreme length of the State from southeast to northwest, a distance of 262 miles, there come the flat, sandy land of tidewater and mild climate; the rolling hills and varied topography of the central part; and finally the mountains and rugged conditions of the westernmost section, where the extreme elevation of 3300 feet above sea level is attained, and a vigorous climate like that of the north prevails. As the topography varies, so do the soils and products — from the peanuts, figs and sweet potatoes of the south to the buckwheat and maple sugar of the north and west. Likewise do the tree species change — from the cypress, white cedar, loblolly pine and red gum characteristic of the south, to the spruce, white pine, yellow birch and sugar maple typical of the north. While practically all of the oaks and hickories found in the eastern United States, with numerous other important species, occur between.

The soils over the southeastern third of the State, comprising the Coastal Plain Division, present all grades of sands and sandy loam to silt loam soils, all resulting from sea deposits. The Central or Pied-

mont section, in which the soils are derived from granite rock, principally consist of loams and clays with rock fragments and gravel, while the mountain soils of the western section contain a predominance of sandy or stony loam soils in the Blue Ridge section, a larger proportion of clay and clay loam in the Alleganies. Existent differences in soils, topography and elevation account for the great diversity of products and conditions prevailing in the State of Maryland.

The total area of the State is 12,210 square miles, of which 2,319 square miles are water. The extreme breadth from north to south near the eastern shore of the Chesapeake is 128 miles, while it is only about 2 miles across near Hancock. The land area, comprising 6,330,039 acres, 9,891 square miles, consists of 2,228,046 acres of woodland, representing 35 per cent; 3,222,982 acres of improved farm land, 51 per cent; 674,955 acres of waste lands, 11 per cent; and 204,056 acres of salt marsh land, 3 per cent. This is later shown by counties and in more detail.

EXTENT AND IMPORTANCE OF FORESTS.

The forests of the State are generally distributed, although the mountain counties have the largest percentage, the southern and eastern shore counties rank next, and the central counties last. Maryland has been settled so long that the land has in the main been assigned to its most profitable uses, and hence the mountain section, containing a large per cent of high, rocky lands unfit for anything but forestry or grazing, has to a large extent remained under a forest cover. Likewise the lands in southern Maryland, located along hillsides or slopes of ravines where soil erosion is excessive under cleared conditions, have either remained in woodland or, if cleared, have been allowed to grow up again in forest. The large wooded areas on the eastern shore peninsula are accounted for by the large percentage of swamp land which cannot be cultivated, but which will generally support a satisfactory growth of forest. In the central and north-central portions of the State, where the land is well-drained and fertile, there is the largest percentage under cultivation, the forest being confined chiefly to rocky ridges and hillsides, and along the streams. The wooded area here is therefore circumscribed, and there is not likely to be a marked change in its relationship. It is true that in some sections clearing is going on rapidly, but in others there are abandoned fields growing up in forest, so that one very nearly offsets the other, and the total remains about the same.

EARLY FOREST HISTORY.

When the first settlers came to Maryland some 275 years ago, forest covered the entire land area of the State with the exception of

marshy areas which at that time probably comprised not over 5 per cent. These forests were very different from those that now exist. The species of trees represented then were much the same as now, but their relative proportion has changed materially. The original forests were nearly all of the hardwood type; now there is a large proportion of pine, especially in sections where land once cleared has been allowed to grow up again in forest.

With the first settlers came fires, which during nearly three centuries have destroyed much more timber than has been used. Fire was an aid to the settler in clearing his land, and timber, having no value at that period, was destroyed in the most effective way. The important thing was to get rid of the forest and make way for the growing of agricultural crops. The timber in the original forest was better and the stands heavier than now exist, and of these virgin forests there now remain but a very few tracts which probably comprise much less than one per cent of the total forest area. The extent of the original forests and the need of clearing them away as quickly as possible for the growing of food crops inculcated in the minds of those early settlers an enmity for the forest which through the successive generations has not been entirely eradicated. The frontiersman's spirit of cutting down and destroying timber is a spirit which expressed itself unconsciously in many ways. To him the forest stood between him and the opportunity of getting a living from the soil, and besides had often harbored unfriendly Indians and predatory animals. The spirit of forest destruction was fostered by economic conditions of the time, and while those conditions have entirely changed in the succeeding years, a spirit of antagonism to the forest still exists in many ways.

In making clearings it was common practice then to girdle the trees as the easiest method of preparing the ground for crops. With the extension of the clearings to include all the best land, timber became less abundant, while the use of it greatly increased. The increase in population called for large quantities of timber in building log houses and in constructing rail fences. This, though, had little effect upon the supply, since the timber taken from the clearings more than supplied the need. With the building of towns and cities there was a greater demand upon the forest, and this gradually developed into a stable market requiring timber beyond local needs. It was no longer taking the timber as an incident to the clearing of land, for it was at this time that forest exploitation actually began. Timber, however, was so abundant and cheap that only the best portions of the choicest trees were utilized. The problem of transporting the timber over poor roads made it cost nearly as much to get it out as it was worth, and stumpage values then were almost negligible.

PLATE II. FIG. 1.—ORIGINAL GROWTH OF HEMLOCK.

The first forests of hemlock in Western Maryland are closely associated with the history of tanning; with their decrease, the industry has steadily dwindled in this State.

PLATE II. FIG. 2.—VIRGIN FOREST OF BEECH AND SUGAR MAPLE.

The still magnificent first-growth forests that once covered in excess of 90 per cent of Maryland now represent less than 1 per cent of its total forest cover.

The first sawmills consisted of a straight saw operated by water power, and working in up-and-down fashion; their capacity under the most favorable conditions was less than 1,000 board feet per day. These were the days when the hewing of timber for framing and other construction purposes was an art universally practiced. Shingles were made by splitting the pieces from clear, straight-grained logs of proper length, to be shaped down to the proper thinness by hand tools. There are a few of the old-fashioned up-and-down mills, with saws operated by water power, still in existence in this State. Their cut of timber, however, is inconsiderable, and they are now curiosities in the lumber business.

The introduction of circular saws, operated by steam power, was a great advance over the water mills, since their capacity was so much greater. This was really the beginning of the lumber business, as the small up-and-down sawmills could do little more than supply the local demand, and that in a very unsatisfactory way. As improvements were made in sawmill machinery, its effectiveness in cutting the forest was very much increased. The small, low-capacity mills gave way to the large, high-powered ones, which could do as much in one day as the first mills in several months. Indeed, sawmills and logging machinery have been more highly developed in the United States than anywhere else in the world, and this is due to the large amount of timber available. Under the highly developed system of lumbering it did not take a great many years to make serious inroads on the forest; with the introduction and extension of railroad facilities, distant markets were opened; and there was no limit to the amount of timber that could be disposed of. The forests that were first cut over to remove the choicest material were visited again and again, each time taking a lower grade of product. It was only in the inaccessible places that any amount of timber was left.

This was a legitimate business, and carried out the universal law of supply and demand. Young growth had no market value, and therefore received no consideration. It has only been in the last twenty years that any attention has been given to the practical application of Forestry, and that in a limited way.

PRESENT FOREST CONDITIONS.

Destructive Agencies: The present condition of the forests is the result of a number of causes working independently and collectively. The forest areas themselves have become fairly fixed, so that no great changes are likely to occur in the future, while the limiting of the forest areas has in the past gone through a process of evolution. Likewise, the character of the forest has been changed to such an extent

as in most cases to bear little resemblance to its original condition. This alteration has been brought about chiefly through four agencies—injudicious cutting, fires, grazing, and tree diseases. All are susceptible of prevention or control.

Injudicious Cutting: For generations a process of culling the forests for the best material in them has been going on without interruption, the only forests that have escaped this destructive influence being those which were so inaccessible as to render lumbering them unprofitable at the time. The forests have not only been culled once, but some of them four or five times, and each culling has left them in worse condition than before. At first only the choicest material was removed and an abundant forest cover left, but with each culling the forests have constantly deteriorated, until in many cases the ground is encumbered with inferior species and worthless material that effectively prevent a more valuable growth. To restore normal conditions the process must be reversed. That is, instead of taking out the most valuable trees, the inferior species should be removed first, and the former left to reproduce the forest.

There has also been a large amount of unnecessary waste in the removal of timber. Not only has an immense quantity of young growth been unnecessarily destroyed, due to careless methods, but a study of the subject has shown that about half of the usable part of the tree is either left in the woods or wasted in sawing. Not only is there a large amount of unnecessary waste, which improved methods would find it profitable to use, but this large amount of debris left in the woods adds immeasurably to the fire risk. Records show that forest fires almost invariably follow lumbering operations.

Fires: The forest fire damage in Maryland for the past five years, from State information, is as follows:

Year.	Amount of Damage.
1911	$225,801
1912	48,212
1913	42,443
1914	129,844
1915	108,966

Even this, however, is not the full measure of damage, since the estimate includes only the timber and trees destroyed, and none of the incidental losses that often amount to more than that. The fire damage has been greatest in the mountain sections, where there are large continuous areas of woodland which become exceedingly dry during certain seasons of the year. This mountain land is rough and

fires are difficult of control, as a fire starting at one end of a mountain is likely to extend throughout the whole length unless control measures are adopted with reasonable promptness. The State's system of forest fire protection, through the Forest Wardens, has accomplished much in reducing the annual fire damage, and in this respect allowance should be made in the above figures, because five years ago a large number of the fires that occurred were not reported, while now there are very few that are not attended and reported by a Forest Warden.

In the central part of the State where most of the woodland is in small tracts, with a large percentage of cleared land, the fires are not nearly so destructive. They are not as extensive in the first place, because of limited wooded areas, and the forests are looked after more closely because of their relatively higher value and the greater number of people available for fire fighting. In southern Maryland much damage is done during exceptionally dry seasons, particularly in the spring when brush burning is commonly practiced, but the climate is more humid and there is more moisture in the soil, both of which have a tendency to reduce fire damage. Fires are less frequent on the eastern shore peninsula than in any other section of the State, due to greater humidity and more soil moisture, for much of the land surface there is less than 20 feet above sea level.

The damage caused by forest fires is not fully appreciated. This is one reason why so many are allowed to occur, and that many which do occur are given little attention by property owners. Not only do fires damage fences and merchantable timber, whose value is more clearly recognized, but fires also destroy on the ground the seed which nature has provided for the perpetuation of the forest. The accumulated leaf litter and partly decomposed organic matter, so important in conserving soil moisture and adding fertility to the soil, are completely destroyed, the ground becoming dry and hard. The small seedlings are consumed, and where the fire is not intense enough to quickly destroy the young growth the bark is burned through on one side, exposing the living wood to decay. The tree may continue to grow, but the decay also increases, stunting its growth and reducing its timber value to a great extent, frequently to the point of making it practically worthless. It is these fire-scars on the young trees and also on older ones which produce the decay ultimately resulting in hollowed trees and many other defects.

A woodland that is repeatedly burned over by fires constantly deteriorates in quality, and the production is greatly reduced or ceases entirely. Fire protection is the first requisite for improved conditions in woodlots; without it there can be no permanent improvement.

Since, however, 90 per cent of the forest fires are the result of carelessness, the situation will improve as rapidly as people are educated to the nature and extent of damage caused by forest fires.

The actual State protective organization consists of 148 Forest Wardens (1916) working under the direction of the State Forester. Of these Wardens, 17 are Patrolmen, and 3 are Watchmen at Fire Lookout Stations. The Forest Wardens receive no salary, but are paid for services rendered. They are all men who are interested in fire protection, and who in this way are giving the State a most valuable service in a conscientious, disinterested way, and with small compensation. The effectiveness of their work is attested by the number of fires attended and extinguished and the decreasing areas burned during the past two years. The system of fire protection now in operation in Maryland is as effective as it is possible to make it without increased appropriations.

Forest Patrolmen are Forest Wardens who are detailed for patrol work during the seasons of greatest fire danger, which occur in the spring and fall. On days when the fire danger is greatest these men, usually mounted, are constantly on patrol duty, covering all parts of their districts and paying particular attention to those sections where fires are most likely to occur. On patrol they are not only constantly on the alert for fires, but also caution those who are likely to be careless, and in other ways secure the co-operation of people in their districts in suppressing the fire danger.

There are two kinds of *Lookout Stations* in use, one where the Forest Warden is constantly on duty, on dry days, during the fire season; and the other where observations are made by a Warden from some lookout point three times during the day — morning, noon, and evening. Of them, one of the former, and two of the latter, are at present in use. Each Lookout Station is connected by telephone with the surrounding territory, so that when a fire is discovered its location is determined as definitely as possible and immediately reported to the Warden nearest the fire, who then goes to it at once, employing assistants where needed to bring it under control. In sections where there is good telephone connection, these Lookout Stations have been of inestimable service in locating fires, limiting the cost of extinguishing them, and reducing the amount of damage done.

Under Section 2 of the Weeks Law (Act of March 1, 1911), there is available for the different States which maintain forest fire organizations, and are expending money in fire protection, certain allotments for the payment of Forest Patrolmen and Lookout Watchmen, on condition that the State will expend at least an equal amount in fire protection. Maryland and the U. S. Forest Service have in this way

PLATE III. FIG. 1.—FIRE SPREADING THROUGH A HARDWOOD FOREST.

The ground fire, starting in leaves and brush, soon extends to the forest growth. While the fire may not assume the proportions of a "crown" one, impoverished soil, destroyed reproduction, and damage to the large trees all result directly from burning of this character.

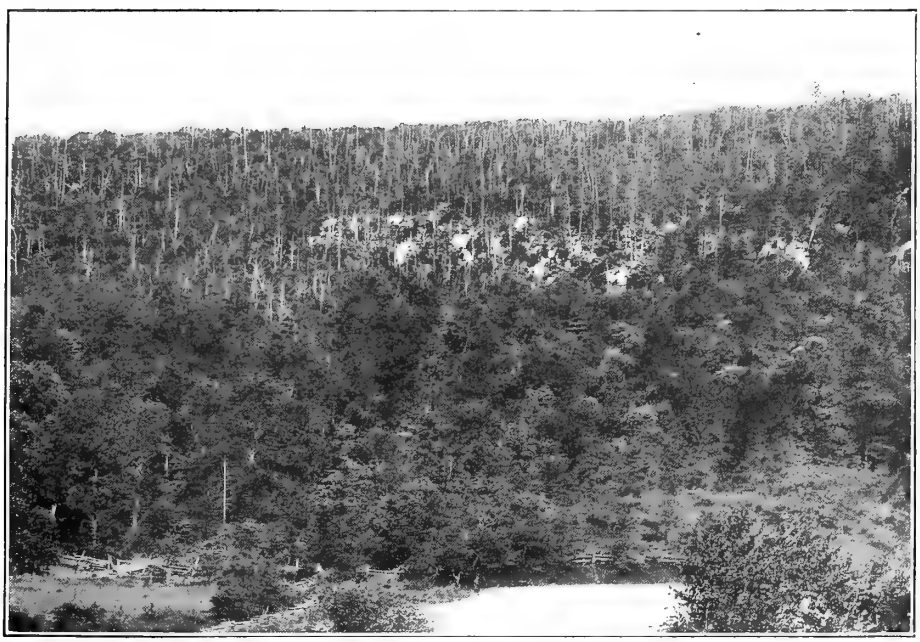


PLATE III. FIG. 2.—EXAMPLES OF FOREST PROTECTION AND FOREST DESTRUCTION.

The original forest was destroyed by repeated fires, as evidenced by dead, white stubs. Since 1906, under State Forest Protection, fires have been prevented, and the waste mountain-side is returning to forest.

been in successful co-operation since the autumn of 1911. Through Act of the 1916 Legislature, with specific appropriation available October 1, 1916, for fire protective work, greater Federal aid has been secured. The State has also been able to generally extend this work, with the promise of increased efficiency.

Grazing: The practice of using woodlots for pasture is common throughout the State, but particularly so in the Piedmont and in the mountain sections of Garrett County. In the mountain forests, especially in those of Garrett, cattle, sheep, and hogs are allowed to range freely on unfenced lands. Under the conditions, grazing in itself does no particular damage to the forest, since stock has such a wide range that close grazing is not possible. But the chief damage is incidental to grazing, and lies in the deliberate setting of fires in the woodlands to burn off the forest and promote a growth of grass. The enforcement of the fire laws, together with the increase of the farming interests of the county, is lessening this practice to the extent that marked improvement locally has been observed in the last four years.

As a local forest problem, the use of woodlands for pasture may be worked out with a fair degree of accuracy. It is an established fact that a woodlot will not serve satisfactorily as pasture land, and at the same time perform its greatest function in timber and wood production. The one is inimical to the other. If the woodland is fully stocked, as it must be for greatest wood production, then the ground will be so completely utilized and shaded by forest cover as to prevent the growth of grass or other forage; on the other hand, if the woodland is sufficiently open to permit a growth of grass, then it will not produce a full crop of timber and it is only a question of time until the tree growth disappears. The effect of pasturing is primarily to destroy the small seedlings and younger reproduction which nature has provided for the renewal of the forest and the maintenance of its proper density. The soil is packed by the trampling of cattle and becomes hard and dry. Open places soon appear in the forest, and if this destruction of reproduction is permitted to continue even the growth of the larger trees will be seriously hampered. Instead of timber with long, clear stems, the trees will be short, limby, and of poor quality.

There are, of course, some advantages in the use of the woodlot for cattle other than in the pasturing that it affords; as, for example, a place where they may escape the hot sun, and where they may be able to brush off troublesome insects. Under certain conditions these uses may not be particularly detrimental to the woodlot itself. In a woodlot fully stocked with young growth which has reached a sufficient

height to be out of the reach of cattle, the ensuing damage, if any, will be very slight, unless the soil itself is damaged by excessive pasturing. This problem must, therefore, be solved by carefully weighing the relative values of the woodlot for pasture or for wood production, and the one which is least important must be sacrificed to the other. It should be understood that they cannot be successfully combined, and it is for the owner to decide between them.

TREE DISEASES.

There are a number of insects and fungous diseases affecting forest trees, some of which have done an immense amount of damage locally in recent years, and others which have been destructive at different periods. It will not be possible within the limits of this report to treat the subject with any amount of detail, but information regarding the different diseases, their life histories, habits, and methods of control, so far as they have been worked out, may be obtained in special publications issued by this Department or by the Federal Government.*

INSECT INJURIES.

The most important insects affecting forest trees are the Locust Borer, the Locust Leaf Miner, the Two-Lined Chestnut Borer, and the Pine Bark Beetle. None of these insects are of wide distribution in the State and they have not done a very great amount of damage. They may of course at any time increase to an alarming extent under favorable conditions, but ordinarily they are held in check by natural enemies or other adverse conditions. Mention is not made here of the numerous insects which feed upon shade trees and often do great damage; though some of them attack the trees in the forest, they are not sufficiently destructive to be classified and described as forest insects.

The Locust Borer, Cyllene robiniae, is found throughout the State, but is most destructive in the central portion, where it attacks locust trees of all sizes, boring into the wood, often honeycombing it, causing the trees to have dead patches on the surface, and rendering them liable to destruction in storms or by having branches broken off. Like practically all other boring insects, they are difficult to reach and little can be done toward their control. In sections where the Locust Borer is at all destructive it is not advisable to plant locust, nor to depend upon it as a forest tree.

The Locust Leaf Miner, Odontota dorsalis, was particularly active and widespread in Maryland during 1912-1915. Its work is characteristically shown by the brown appearance of the foliage of locust

* Samples of insects and fungi sent to the State Forester will, wherever possible, be identified, and advice given as to methods of control.

trees after the middle of July. The adults feed upon the tender parts of the leaf during early summer, while the larvae feed upon the under surface of the leaves, eating away the more delicate portions between the larger veins and taking out the green portions between the epidermal layers. This causes the rusty appearance of the trees, very much as though they were dying; many of the leaves in fact, do fall. Since the foliage is not usually attacked by the larvae until the middle of July, when the trees have made their principal growth, the insects have not so far caused a great amount of damage. The trees leaf out again next spring as usual, and aside from retarding the growth in the latter part of the season, and the disfigured appearance of the trees, no serious consequence is the result. The disease was apparently much more pronounced in 1913 and 1914 than was the case in 1915, and scarcely noticeable in 1916, indicating that it passes through certain cycles, in common with most insect pests. There appears to be no practical remedy for dealing with the disease under forest conditions, although in the case of shade trees spraying early in the season, to poison the leaf-eating adults, is beneficial. Since the larvae feed between the epidermal layers of the leaf and cannot be reached by a spray, it seems impracticable to attack them at that stage.

The Two-Lined Chestnut Borer, Agrilus bilineatus, is believed to have caused considerable damage to chestnut in southern Maryland, and also to be responsible for killing many oak trees. The insect operates just under the bark of the tree, making galleries from six to ten inches long, which run more or less horizontally around it. When the tree is attacked by a number of these insects it is quickly girdled. The name of this borer is derived from the appearance of the adult beetle, which appears during May and early June. It is about three-eighths of an inch long, black in color, and marked with two yellowish lines extending longitudinally along the back. It has one or more parasites which apparently are holding it in check, so that the amount of damage done has not been considerable as yet.

FUNGOUS DISEASES.

Among the fungous tree diseases of the State the only one of far-reaching importance is the Chestnut Blight—*Diaporthe parasitica.* It is not known for how many years this disease has been present in Maryland, but it was observed in 1910 as a particularly virulent disease that was spreading rapidly in the northeastern part of the State.

This parasitic growth was probably introduced from China, and has spread more rapidly and caused more damage than any other tree disease in the country. It affects only the chestnut and chinquapin, attacking trees of all sizes, and while the attack is usually in the

tops and branches, no portion is immune. It is disseminated by means of spores carried by the wind, insects, or other agencies, and the spores germinate in cracks or abrasions of the bark, sending their root-like structure into the inner bark and developing a canker which soon encircles the portion of the tree attacked, causing its death. It only works in the inner bark and one or two outer rings of the wood, so that the timber itself is not destroyed, and may be used if utilization takes place before natural decay begins. More time and effort have been expended in an endeavor to control this disease than any other that has been introduced, but so far they have been without avail, and the only course to pursue is that of cutting and utilizing the trees before they are completely killed and much less merchantable.

This is one of the parasitic fungi which attack living trees, and while there are a number of others that are more or less common, such as *peridermium*, which attacks the Scrub Pine, they are of so little importance as to require no special mention in a report of this character.

IMPORTANT TIMBER TREES.

Of the great variety of commercially valuable timber trees found in the State it is difficult to select those of commanding importance. The variety is so great as to enable the State to furnish material for all uses except those in which tropical woods are required, and while many kinds of Maryland wood have occupied a very important place in numerous industries, the exhaustion of virgin forests with their high-grade material has created the impression among users of timber that satisfactory supplies from this State are no longer available.

It is true that large supplies of a single kind of material are not easily obtained at any one point, but a better understanding of the available supplies in different parts of the State, with improved methods of exchange will, it is believed, help to overcome this difficulty. There have been numerous instances of manufacturers importing woods at a high cost, where equally good supplies might have been secured within the State at greatly reduced prices. In one case a large wood-user had imported a special kind of wood from Michigan at considerable expense until he found that a species, native to this State and common to his own county, though not generally used, was just as good for his purpose, and could be obtained at one-third of the cost.

NATIVE FOREST TREES.

There are 70 species of trees in the State which may be classed as such, although some of them are of very little importance. In the

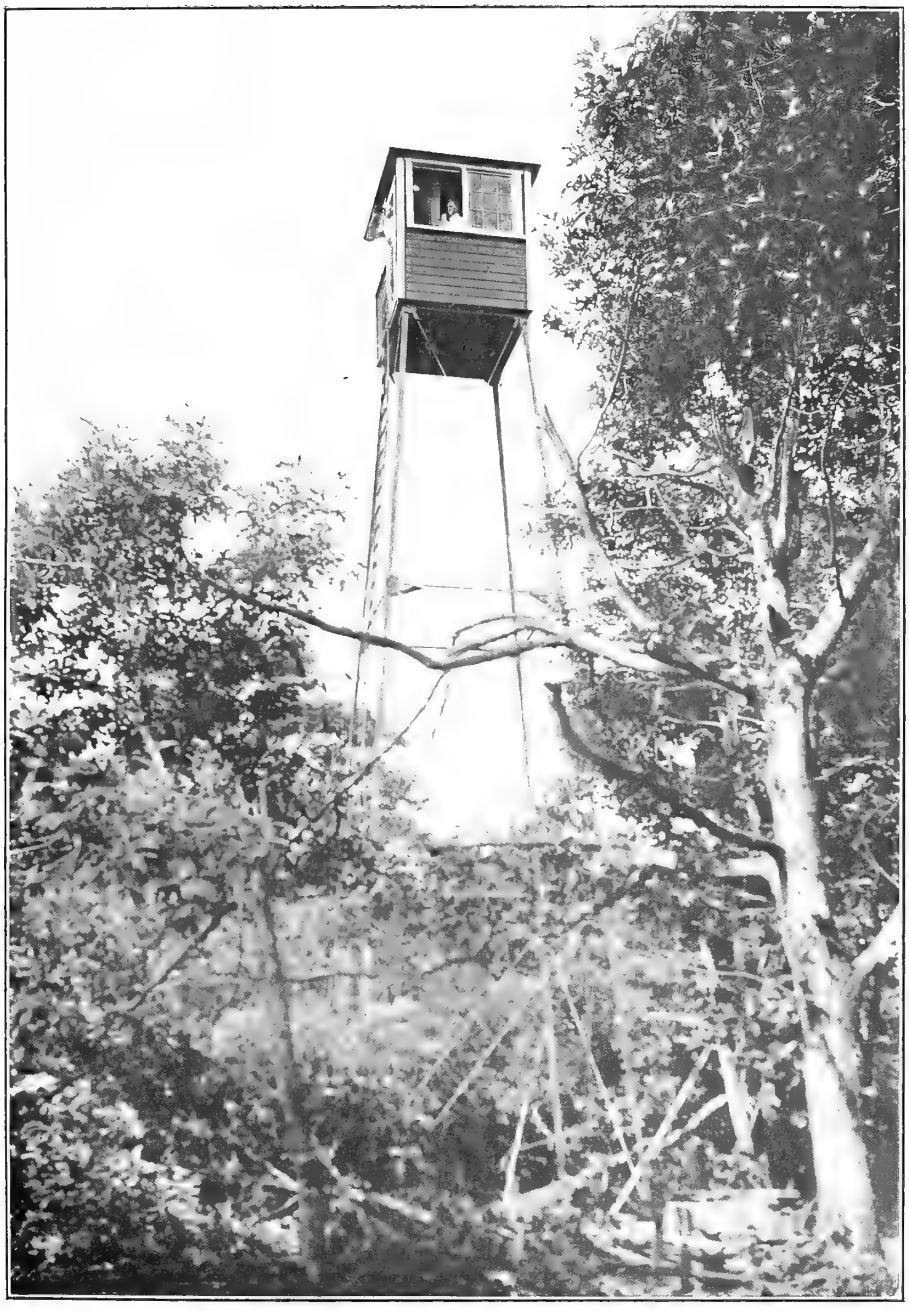


PLATE IV. FIG. 1.—FIRE PROTECTION ON MOUNTAIN LAND.

The State's fire tower on Meadow Mountain, Garrett County, overlooks 150,000 acres of woodland, and is connected by telephone with the various Forest Wardens.

tabulated list below an attempt has been made to list the trees according to their commercial importance, and to indicate in which sections of the State each is found.

For this purpose the State is taken in four divisions: Western Maryland—Garrett, Allegany, Washington and Frederick Counties; Central Maryland—Carroll, Baltimore, Harford, Upper Cecil, Howard and Montgomery Counties; Southern Maryland—Prince George's, Anne Arundel, Charles, St. Mary's and Calvert Counties; and Eastern Shore Maryland — Lower Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Somerset and Worcester Counties.

In the table Western Maryland is indicated by the initial *W*, Central Maryland by the initial *C*, Southern Maryland by the initial *S*, and the Eastern Shore by the initial *E*.

Species: Common Name.	*Botanical Name.*	*Distribution.*
White Oaks:		
White Oak	Quercus alba	C. E. S. W.
Chestnut Oak	Quercus prinus	C. W.
Post Oak	Quercus minor	C. W.
Swamp White Oak	Quercus plantanoides	C. E. S.
Cow Oak	Quercus michauxii	E.
Red Oaks:		
Red Oak	Quercus rubra	C. S. W.
Black Oak	Quercus velutina	C. S. W.
Scarlet Oak	Quercus coccinea	C. S. W.
Spanish Oak	Quercus digitata	C. S. W.
Pin Oak	Quercus palustris	C. E. S.
Willow Oak	Quercus phellos	C. E. S.
Black Jack Oak	Quercus marilandica	C. S. W.
Water Oak	Quercus nigra	C. E. S.
Chestnut	Castanea dentata	C. S. W.
Yellow Pines:		
Loblolly Pine	Pinus taeda	E.
Scrub Pine	Pinus virginiana	C. S.
Pitch Pine	Pinus rigida	C. S. W.
Shortleaf Pine	Pinus echinata	C. S.
Table Mountain Pine	Pinus pungens	W.
Tulip Poplar	Liriodendron tulipifera	C. E. S. W.
Hickories:		
Mockernut Hickory	Hicoria alba	C. S. W.
Shagbark Hickory	Hicoria ovata	C. W.
Pignut Hickory	Hicoria glabra	C. S. W.
Bitternut Hickory	Hicoria minima	C. W.

Species: Common Name.	*Botanical Name.*	*Distribution.*
Hickories:		
Small Pignut Hickory	Hicoria odorata	C. W.
Shellbark Hickory	Hicoria laciniosa	C. W.
Red Gum	Liquidambar styraciflua	C. E. S.
Black Walnut	Juglans nigra	C. S. W.
White Pine	Pinus strobus	W.
Maples:		
Sugar Maple	Acer saccharum	W.
Red Maple	Acer rubrum	C. E. S. W
Silver Maple	Acer saccharinum	C.
Striped Maple	Acer pennsylvanicum	W.
Mountain Maple	Acer spicatum	W.
Black Gum	Nyssa sylvatica	C. E. S. W.
Ashes:		
White Ash	Fraxinus americana	C. S. W.
Black Ash	Fraxinus nigra	C. E. S. W.
Red Ash	Fraxinus pennsylvanica	C. E. S. W.
Birches:		
Yellow Birch	Betula lutea	W.
River Birch	Betula nigra	C. S.
Black Birch	Betula lenta	C. S. W.
Beech	Fagus americana	C. S. W.
Basswood	Tilia americana	C. W.
Cucumber	Magnolia acuminata	W.
Sycamore	Platanus occidentalis	C. E. S.
Elms:		
White Elm	Ulmus americana	C. E. S. W.
Slippery Elm	Ulmus pubescens	C. E. S. W.
Hemlock	Tsuga canadensis	W.
Black Locust	Robinia pseudacacia	C. E. S. W.
Red Cedar	Juniperus virginiana	C. S.
Cherries:		
Black Cherry	Prunus serotina	C. W.
Wild Red Cherry	Prunus pennsylvanica	C. W.
Butternut	Juglans cinerea	W.
Bald Cypress	Taxodium distichum	E.
Sassafras	Sassafras sassafras	C. E. S. W.
Persimmon	Diospyros virginiana	C. E. S.
Red Mulberry	Morus rubra	C. E. W.
White Cedar	Chamaecyparis thyoides	E.
Spruces:		
Black Spruce	Picea mariana	W.
Red Spruce	Picea rubens	W.

Species: Common Name.	*Botanical Name.*	*Distribution.*
Willows:		
Black Willow	Salix nigra	C. S.
Sandbar Willow	Salix fluviatilis	E.
White Willow	Salix alba	C. E. S. W.
Dogwood	Cornus florida	C. E. S. W.
Holly	Ilex opaca	C. E. S. W.
Blue Beech	Carpinus caroliniana	C. E. S. W.
Hornbeam	Ostrya virginiana	C. W.
Redbud	Cercis canadensis	C. W.
Tamarack	Larix laricina	W.
Poplars:		
Aspen	Populus tremuloides	W.
Poplar	Populus grandidentata	C. S. W.
Swamp Cottonwood	Populus heterophylla	C. E. S.
Hackberry	Celtis occidentalis	C. E. W.

THE LAND AREA OF MARYLAND.

Classified According to Present Use*

COUNTIES	Wooded Area	%	Improved Farm Land	%	Waste Land	%	Salt Marsh Land	%	Total Land Area
Allegany	163,832	62	70,513	26	32,018	12	.....	..	266,363
Anne Arundel	92,266	34	139,127	50	41,891	15	1,216	1	274,500
Baltimore	103,515	24	230,471	58	65,739	17	3,456	1	403,181
Calvert	62,390	45	74,128	53	2,046	2	768	..	139,332
Caroline	62,834	30	128,206	62	15,646	7	1,664	1	208,350
Carroll	39,292	13	225,598	76	31,139	11	.....	..	296,029
Cecil	53,543	24	140,980	62	24,514	11	4,160	3	223,197
Charles	171,547	59	60,969	21	43,886	15	14,144	5	290,546
Dorchester	138,291	37	123,679	34	27,851	8	78,848	21	368,669
Frederick	91,117	21	301,430	70	40,583	9	.....	..	433,130
Garrett	274,483	63	122,318	28	39,820	9	.....	..	436,621
Harford	81,872	29	171,473	60	22,432	9	7,232	2	283,009
Howard	38,644	25	114,027	71	6,771	4	.....	..	159,442
Kent	33,776	19	139,786	77	1,254	1	5,056	3	179,872
Montgomery	68,821	22	209,153	70	24,907	8	.....	..	302,881
Prince George's	127,200	41	154,414	50	25,130	9	128	..	306,872
Queen Anne's	59,270	26	131,607	57	38,013	16	2,880	1	231,770
St. Mary's	119,080	51	98,247	42	15,804	7	832	..	233,963
Somerset	68,387	25	76,449	28	84,864	31	43,480	16	273,180
Talbot	45,822	29	87,643	55	21,923	14	3,392	2	158,780
Washington	72,274	24	191,842	63	41,006	13	.....	..	305,122
Wicomico	111,608	46	109,092	45	7,431	3	14,144	6	242,275
Worcester	148,182	47	121,830	40	20,287	6	22,656	7	312,955
The State	2,228,046	35	3,222,982	51	674,955	11	204,056	3	6,330,039

*Note: Areas of salt marsh land — Conservation Commission, Maryland.
Improved farm land — Dept. of Agriculture, U. S.
Wooded area and waste land — State Board of Forestry, Maryland.

PLATE V. FIG. 1.—DESTRUCTION OF CHESTNUT BY THE BLIGHT.

The Chestnut Blight has killed a large percentage of the chestnut in hardwood forests, from New England to Maryland; and the end of the destruction of this species has not yet been reached in the State. It is no longer a question of prevention, but of utilization.

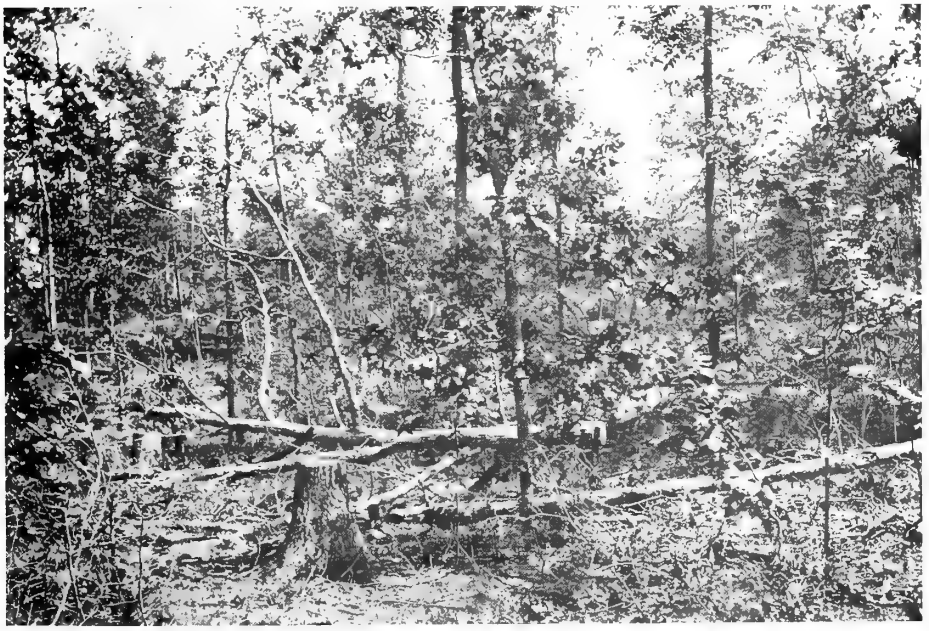


PLATE V. FIG. 2.—A CULLED FOREST, WITH LOGGING WASTE, IN SOUTHERN MARYLAND.

The net result of careless lumbering is the stand culled of its best; and the natural consequence of waste like this is the forest fire.

PRINCIPAL USES OF THE FOREST.

The most important use of the forest, here, as elsewhere, is for *Lumber*. The production for 1914 amounted to 229,027,500 board feet, 129,105,500 board feet being hardwood, and 99,922,000 pine, with a very small proportion of hemlock. This represents a value at the mills of $3,823,463. There are only a few large stationary mills in the State, the bulk of the lumber being cut by portable mills of varying size and kind, whose capacity usually runs from 4,000 to 12,000 board feet daily. These mill operators engage in buying timber lots, and move from place to place as new tracts are found. Most of the pine lumber is cut in the eastern shore and southern sections of the State, while the bulk of the hardwood comes from central and western Maryland.

The lumber production of the State has decreased in the last few years because of the exhaustion of large stumpage holdings in the western part of the State, so that now the lumber business is more generally distributed but not so important. It is believed, however, that a more stable condition has been reached, and that the present cut may be continued for many years, or actually increased under better systems of forest management. With reduced supplies of stumpage and increased prices, there is a strong tendency toward closer cutting and utilization to a smaller diameter limit.

Pulpwood.—While the pulpwood business ranks next in importance to that of lumber, with a value of $444,029 and a cut of 74,002 long cords as reported in 1914, its field of activity is much more localized, as two-thirds of the production is from five southern Maryland counties—Prince George's, Charles, Anne Arundel, St. Mary's and Calvert. Fully nine-tenths of the pulpwood is furnished by three species, Scrub Pine, Red Gum and Tulip Poplar.

Scrub Pine, a tree which comes in quickly on abandoned fields in southern Maryland, and which up to twelve years ago had no value except for cordwood, is now the most extensively used for pulpwood, making up practically two-thirds of the total production. The trees are generally cut during late spring and summer, when they peel most readily. The bark is removed, and the stems are cut into five-foot sections. After remaining piled in the woods until they have become partially seasoned, the wood is hauled to railroad or water shipping points and sent to the various pulp mills, generally to be shipped outside of the State. Practically all of the wood is handled by dealers who usually buy it on the stump, having the cutting and piling done by day labor or by contract.

Red Gum, a timber tree growing in swampy land in the southern part of the State, is also extensively used for pulpwood, and with tulip

poplar, which makes the best pulpwood of any of the native species and is cut for the purpose over a wider area than any other, forms most of the remaining third of the total output.

Railroad Ties.—The 925,392 railroad ties valued at $440,685, as reported in 1914, indicate the importance of this business. Railroad ties are cut in all parts of the State, although the Eastern Shore section contributes but a small per cent, and since little capital is required to produce them and they are salable at the nearest railroad point, there are great numbers of producers. A ready market and little expense of manufacture stimulate the cutting of a great many small, thrifty trees for this use before they have reached the most profitable merchantable size.

White oak, always a preferred tie material, formerly constituted the larger part of the product, but it is now becoming scarce, and other oaks are being largely substituted, especially where preservative treatment is possible. The principal species used are white oak, red oak (several species), chestnut, and a small per cent of pine.

Piling.—The counties bordering the Chesapeake Bay and its tributaries contribute the great bulk of the piling that is produced in the State. Of the amount produced probably three-fourths is oak, and the remainder principally pine. White oak, because of its greater strength and durability, brings a higher price, but several of the red oaks, particularly pin oak, which generally produces long, straight stems suitable for the purpose, are much used. Pine is the cheapest and most easily obtained in desired shapes, but it is the least durable.

Cordwood.—The 85,355 cords of wood valued at $270,380, reported as sold in 1914, represent but a small portion of the wood used in the State, since no account was made of that cut and used for home consumption. Of the amount produced, approximately one-third was hardwood, chiefly oak and chestnut, while the remainder was principally pine. It is a low-grade product which cannot be profitably shipped for any great distance, and therefore the principal markets are found in the nearby towns where the local demand is usually supplied directly to the consumer by the adjacent landowners.

Mine Props.—This industry is confined principally to two widely separated sections of the State—the eastern shore peninsula and western Maryland—and the size of props, woods used, and method of sale are entirely different in the two localities. In the Eastern Shore section loblolly pine forms practically the entire output, and props 27 to 36 feet long are cut from the larger trees.

Trees ordinarily used for this purpose are from 14 to 20 inches in diameter, and the product is generally sold by the ton. The props are shipped to the anthracite coal fields and there cut into suitable lengths.

The production for this section, as reported in 1914, was 56,787 tons. Since the trees cut for mine props are also of a suitable size for saw timber, the two uses are competing, and the length of haul is generally the determining factor. The mine props cannot be hauled profitably for as great a distance as lumber, and therefore where the haul exceeds three miles the product generally goes into saw timber instead of mine props.

The other section of the State where the cutting of mine props is an important business is in the vicinity of the coal fields in western Maryland. The mine prop output coming from the three westernmost counties, Garrett, Allegany and Washington, amounted in 1914 to 46,550 tons. The props used, however, in the coal mines of western Maryland are very different from those produced in the southeastern part of the State, particularly in the size of the trees cut for the purpose, and that *all* species of suitable size are cut. Round props, measuring four inches at the top and varying in length from eight to twelve feet, are required, and a great variety of wood is used. In the logging operations here the very small trees, left after lumbering for saw timber or for railroad ties, are cut into mine props which are sold at a price little more than covering the cost of production and freight, with little, if any, allowance for stumpage value.

A few of the large-sized mine props are cut in southern Maryland from Scrub Pine, but they form a very small per cent of the total production for the State.

Tan Bark.—Tan Bark was produced in seven of the western and central counties of the State in 1914, the total production being 34,360 tons, valued at $253,510. Of this, hemlock constituted nearly two-thirds of the total production, oak, principally chestnut oak, the remainder. The amount of bark produced in this section was very much greater a few years ago, but with the exhaustion of the main timber supplies the production of bark has decreased with that of lumber, of which it may be termed a by-product. There are now three large tanneries in the State, and a few small ones, which receive most of their supply of bark from Maryland. For the past twenty years there has been a sharp decline in this industry, due to the rapid exhaustion of chestnut oak and hemlock timber supplies.

Staves and Heading.—This represents a production of 30,389,019 pieces valued at $223,931, and reported from five counties. About half of the number were barrel staves and headings, the remainder keg staves and headings. Pine constituted nine-tenths of the wood used, and of the remainder, consisting of several species, chestnut was the most important. The barrel staves were principally for oyster and vegetable containers, the bulk of them being used locally, while prac-

tically all of the keg staves were sent out of the State, their principal use being for nails, bolts, horseshoes, etc. In cutting keg staves small trees are often utilized, the most desirable size being from six to eight inches in diameter. The tops are utilized to a diameter of three inches.

Poles.—The cut of poles reported was 62,135, with a value of $180,-042. Practically all of the western, central and southern counties contributed to this output, of which nearly all was chestnut, the only exception being 4,000 white cedar and cypress poles cut along the Pocomoke River and its tributaries in Worcester and Wicomico Counties. Many small poles are used in local telephone lines, but the bulk of them are shipped out of the State. The Chestnut Blight, which is so seriously affecting the chestnut trees, has forced great quantities of chestnut on the market in the past few years, causing over-production with resulting low prices.

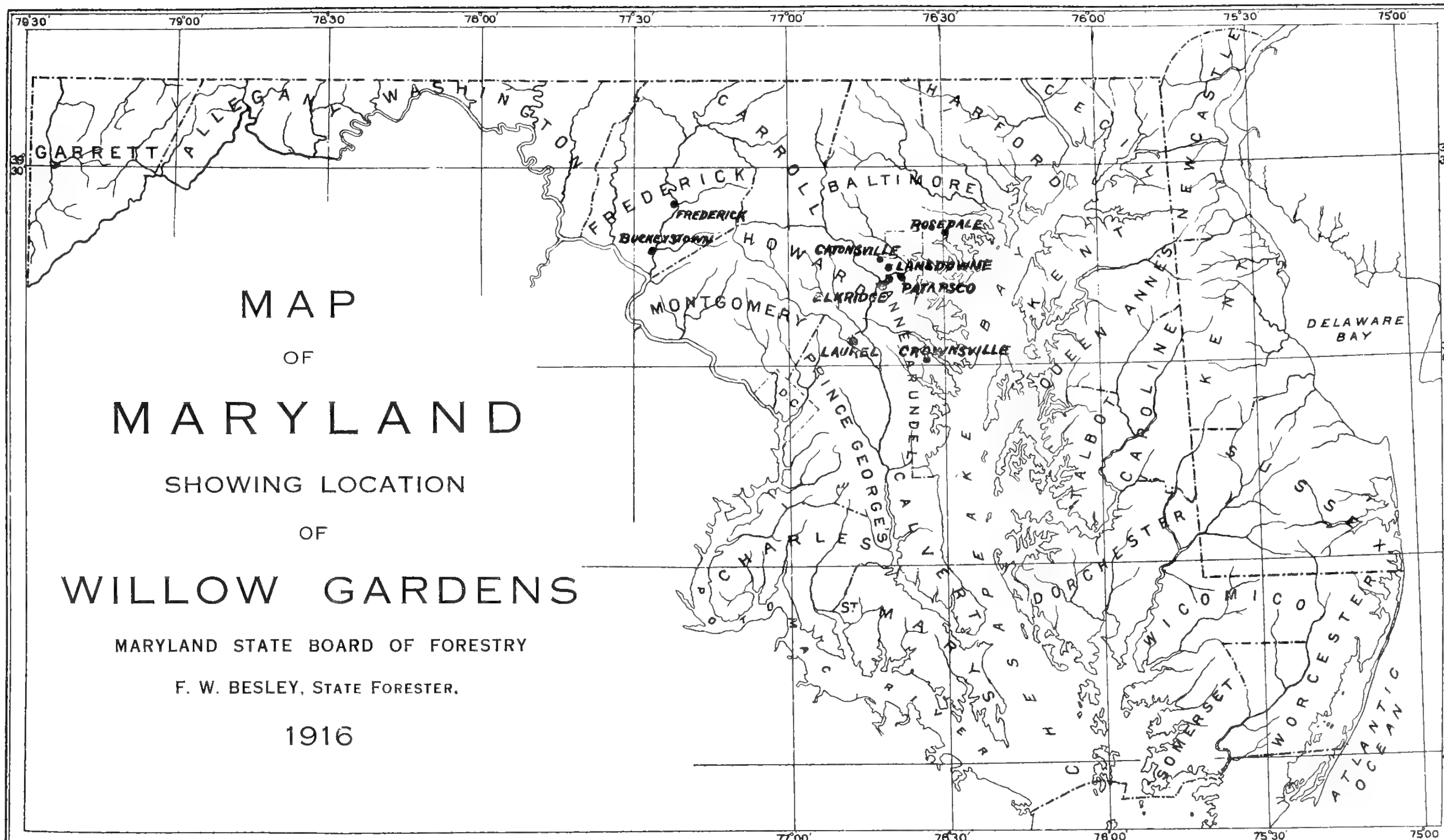
Shingles.—The 13,842,000 shingles valued at $45,901, and cut in 1914, were principally chestnut, with a small amount of white pine in the western part of the State and cypress in the southeastern section. All except three counties of the State reported a cut of shingles, but in only three of them did the cut exceed 1,000,000, viz: Montgomery, Frederick and Howard, in which all the shingles were chestnut. These were cut either by portable sawmills, many of which are equipped for their manufacture, or by individually operated shingle machines.

Lath.—14,837,000 lath were cut in 1914, with a value of $45,282. The cut was distributed over nearly all of the counties, Allegany, Dorchester, Garret, Wicomico and Worcester each reporting a million or more. Pine was the species almost universally used, and in nearly every case the lath were cut from material not suited for lumber, so that they may be regarded as more or less a by-product of the lumber mills.

Mine Ties.—This product is only reported from the three westernmost counties of the State, in the mining region. The total output was 260,000, valued at $39,000. Low-grade material too small for saw timber was generally used. A variety of species enter into the product, but the principal kinds are birch, maple and several kinds of oak, the latter supplying the bulk of the cut.

Posts.—The total production—133,645 posts, valued at $20,587—was a local product reported in nearly every county of the State. Most of them were sold locally and consisted principally of locust, cedar and chestnut.

Export Logs.—This product consists of large, choice logs of walnut, poplar, oak, and a few other valuable species, culled from the forests, shipped to Baltimore, and there exported in the rough. The


MAP
OF
MARYLAND
SHOWING LOCATION
OF
WILLOW GARDENS
MARYLAND STATE BOARD OF FORESTRY
F. W. BESLEY, STATE FORESTER.
1916
GARRETT
ALLEGANY
WASHINGTON
FREDERICK
CARROLL
BALTIMORE
HARFORD
CECIL
HOWARD
MONTGOMERY
PRINCE GEORGES
ANNE ARUNDEL
CALVERT
CHARLES
ST. MARYS
KENT
QUEEN ANNES
TALBOT
CAROLINE
DORCHESTER
WICOMICO
SOMERSET
WORCESTER
NEW CASTLE
KENT
SUSSEX
D.C.
FREDERICK
BUCKEYSTOWN
CATONSVILLE
LANSDOWNE
PATAPSCO
ELKRIDGE
ROSEDALE
LAUREL
CROWNSVILLE
DELAWARE BAY
ATLANTIC OCEAN
CHESAPEAKE BAY
POTOMAC RIVER
79°30′
79°00′
78°30′
78°00′
77°30′
77°00′
76°30′
76°00′
75°30′
75°00′
39°30′
39°00′
38°30′
38°00′

production reported recently is 329,000 board feet annually, valued at $9,870. It is shipped in the log, because it takes a lower customs duty and is the more readily available for the various forms into which it is finally manufactured. Most of it is used for veneer, except walnut, which is largely and increasingly used for gun stocks. Six counties within a radius of 50 miles of Baltimore reported shipments of export logs in 1914.

Pinwood.—The only county in the State to report this product was Washington County, with 440 cords valued at $3,960. For this purpose locust is used, cut into lengths of approximately 4 feet, and sold by the cord to a large establishment at Hagerstown which produces considerable quantities of insulator pins. Though red oak also is somewhat used, black locust constitutes the chief source of the telegraph pin manufacturer's wood supply.

SPECIAL USES OF THE FOREST.

Among the special uses of the forests not directly associated with timber production are the growing of basket willow, the production of maple sirup and sugar, and the manufacture of charcoal. These are all uses and products that may more properly be classed under the forest than any other division, and while they are somewhat localized, they nevertheless comprise important industries.

Willow Production.—The growing of basket willows is an important industry in the vicinity of Baltimore. The other centres are Lansdowne, Halethorpe, Elkridge and Laurel, with scattered plantations at Frederick, Buckeystown, Rosedale, Catonsville and Crownsville. Three kinds of willow are used—the Lemley, American Green, and Welsh—and instead of being permitted to grow to tree form they are annually cut back to near the surface of the ground. The rods which represent a season's growth are from 4 to 10 feet in length, are cut during the winter, peeled, and sold to basket makers and dealers by the pound. The production reported in 1914 amounted to 400,000 pounds, valued at $30,000. Due to the widespread cutting off of imports from Europe during this year and several following, willow growing in this country, including Maryland, has been markedly stimulated.

Maple Sirup and Sugar.—The Sugar Maple is a tree indigenous to mountain sections, occurring locally over restricted areas in Garrett County. The principal stands are in the vicinity of Grantsville and Bittinger, with very much smaller ones near Hoyes Run and the southwestern part of the county. It is the practice in these sections, in cutting woodlands where Sugar Maple constitutes a considerable percentage of the stand, to take out all but these trees, which then are

left in the form of sugar groves or "camps." More recently, however, advancing prices paid for Sugar Maple timber have resulted in the cutting down of many of these fine old groves.

The maple trees, of course, are tapped each spring, the amount of sugar or sirup produced depending upon the season. The Census reported for 1909 a production of 351,908 pounds of sugar valued at $24,985, and 12,172 gallons of sirup worth $9,401, making a total of $34,386 for the product of approximately 80,000 trees. It is probable that this production has been maintained on an average since 1909, and the value of the product has increased because of the higher price now obtaining for both sugar and sirup.

Charcoal.—The production of charcoal is not as important as it was some years ago, due to changes in the industries in which it was formerly used. But three counties—Anne Arundel, Cecil and Charles—reported a production which amounted to 95,000 bushels, valued at $9,500. Up to fifty years ago, and for more than a century before, the cutting of wood for charcoal production was a very important business, as it was then used extensively in iron manufacture in several different sections of the State.

For example, the Principio Furnace, which is, except for the Muirkirk Furnace in Prince George's County, the only one now operated in the State though to a very limited extent, formerly used large quantities of the charcoal produced from its 10,000 acres of woodland. The Principio Company was organized in 1722, and in 1774 the Catoctin Furnace, in the mountains of the same name, was built. The latter ceased to operate about 20 years ago, though it also had large holdings of woodland comprising nearly 10,000 acres, which it had cut over periodically for charcoal production. The Green Spring Furnace, in the vicinity of Fairview Mountain, likewise discontinued operations, in 1873, but during its active period, covering twenty-five years, it used the entire product of its 7,000 acres of woodland for charcoal production. Harford Furnace, on a branch of Bush River; another, at The Rocks in Harford County; and still other smaller ones, all contributed to the charcoal industry.

THE WOOD-USING INDUSTRIES OF MARYLAND.

The industries producing wood and timber maintain a greater number of establishments than any other in this State, and normally there is but one industry in Maryland where the value of the products, and the number of dependent wage-earners, exceed those of the lumber business and allied trades. Together they operate 1,168 establishments, employ 16,790 men, and have an output valued at $31,381,837. Under the head of *production* are included mills which

PLATE VI. FIG. 1.—THE PASTURED WOODLOT.

Over-grazing of this stand has resulted fatally for reproduction, and there has been caused a thin soil cover and an almost total absence of all new growth.

PLATE VI. FIG. 2.—THE PROTECTED WOODLOT.

Protection from fires and elimination of grazing are soon evident. Note the healthy young growth, good ground cover, and thrifty growing condition.

manufacture rough lumber, shingles, cooperage materials; finished lumber, sash, doors, blinds, and interior finish; and wooden packing boxes. These, together with the additional operators producing ties, poles, posts, and similar forest products, have 845 separate establishments and plants, employ 9,838 men, and produce goods worth $14,874,837. Those allied concerns which carry further the *manufacture* of these wood products include the paper and wood pulp trade, shipbuilding, furniture and refrigerators, canes and umbrellas, musical instruments, carriages, wagons and automobiles, cigar boxes, baskets, rattan and willow ware, cooperage and miscellaneous manufactures. They maintain 323 plants with 7,942 employees, and have an annual product whose value was placed by the Thirteenth Census at $17,507,000. In explanation it may be said that while the last-named industries do not use wood exclusively in making up their output, they supply products, nevertheless, in which wood constitutes a large share of all the raw material converted.

A thorough investigation begun in 1909 by the Maryland State Board of Forestry and the United States Forest Service disclosed that Maryland wood-using or manufacturing industries then in operation were annually converting into finished products 284,346,895 feet of raw material in the shape of rough lumber. Twenty per cent, approximately, was State-grown, and eighty per cent supplied from States and countries outside. Its cost at the factory was $5,878,631, averaging $20.67 per thousand feet. The average price for State-grown woods was $14.44 per thousand; for those from outside, $22.25. This is explained by the higher freight rates obtaining on the latter, and partly by the fact that woods not grown in Maryland, but sold here, were generally of higher grade than those locally produced and marketed.

Woods used differed widely in amounts and kinds—from 130,699,500 board feet of loblolly pine, 27,889,000 feet of longleaf, and 22,030,800 feet of white oak, to 25 feet of Turkish boxwood. Only 25 per cent of this loblolly was Maryland-grown, none of the longleaf, and but 15 per cent of the oak. Locust and dogwood were the only two in a list of 54 species used commercially to have the distinction of being produced altogether in Maryland. Pitch pine, red gum, and chestnut were very nearly so, however. Regarding the disposition of those great amounts of wood which are brought in to be manufactured here, it may be said that makers of boxes, crates and packing cases absorb a greater amount of wood than any other single industry, nearly 48 per cent of the total consumption being so used. Interior finish follows with 28 per cent; furniture, with 6 per cent, is third.

Maryland manufacturers of wood were at that time, in 1909, deriv-

ing their supplies of this commodity from thirty-four different States and thirteen foreign countries. Twenty-six of the fifty-four species of wood reported as used came in part from Maryland, the largest representation of species in other States occuring in Virginia, with twenty-four, West Virginia with twenty, and Pennsylvania with fifteen. In 1916 just twenty-seven States appear, with the addition of the Philippines. The States of Connecticut, Delaware, Massachusetts, Minnesota, New Hampshire, Oklahoma and Texas are not now given by manufacturers as the source of wood supplies, and when the relatively small size of the New England and Middle Atlantic States among this number, and the length of time during which their standing timber has been exploited and sold, are considered, it is not so surprising that they are no longer generally continuing as lumber exporters. Two new States, however, appear in the list of 1916 which were not in that of seven years before, they being, namely, Idaho and Illinois. The amount of wood from Illinois is not of course large, but increasing amounts of pines are being sent East from Idaho and other far-Western States. All those from which Maryland is now drawing supplies of wood are Alabama, Arkansas, California, Florida, *Georgia,* Idaho, Illinois, Indiana, Kentucky, Louisiana, Maine, *Maryland, Michigan,* Mississippi, Missouri, New Jersey, New York, *North Carolina,* Ohio, *Oregon, Pennsylvania, South Carolina,* Tennessee, *Virginia,* Washington, Wisconsin and *West Virginia.* Those given in italics are regarded as particularly important. The foreign countries from which this State also receives importations of timber are Africa, Brazil, Canada, the East Indies, Honduras, India, Mexico, Russia, San Domingo, Turkey and the West Indies. Among these the names of Australia, Ceylon and France no longer appear, while the East Indies and San Domingo are additions since the list of 1909. Those which are given are the foreign lands from which Maryland imports of wood are normally drawn; probably less than half of them are carrying on any traffic with the State as this Report is written.

The various wood-using plants which at present constitute this industry in Maryland are not evenly distributed over the State as a whole, but rather restricted to three principal centers: Baltimore, City and County; Salisbury; and Hagerstown. In the State Baltimore leads, of course; Salisbury, in Wicomico county on the eastern shore, takes second place in the State in importance of its wood-using industries; Hagerstown, in Washington county, is the principal center of the wood-manufacturing industry in western Maryland, in addition to ranking third in the State. These cities determine also the county leadership, Baltimore, Wicomico and Washington counties leading in the order named. Several things have naturally determin-

ed the centering of these establishments. In the case of Baltimore these reasons are very obvious—labor, markets, means of transportation, and adequate facilities of every sort immediately at hand. For Hagerstown also the reasons are quite apparent since it possesses, next to the City and County just mentioned, the finest railway transportation of any section of the State. Washington County itself has the second largest county mileage in steam and electric roads, and Hagerstown, at its center, is reached by a network of lines from points outside. This unusual accessibility by rail also tends to promote conditions of labor and the supply of laborers, while a further advantage which should not be undervalued lies in the large supplies of wood and timber which are constantly being cut in the mountain country to the west, not only in the two Maryland counties of Garrett and Allegany, but in the adjoining States of Pennsylvania and West Virginia. Incidentally, the timber purchased locally in the Hagerstown valley, because of the favorable conditions under which it grows, is of exceptional grade and adaptability.

Salisbury possesses decided advantages in combined water and rail shipment. It is convenient to the pine-producing centers of the Southern seaboard from which is drawn the great bulk of its rough lumber for manufacture and Wicomico County itself has woodland aggregating 46 per cent of its total area. It is nearby other counties with still larger areas of timber, all conducive to supplying material for industries of far-reaching importance.

As was pointed out in the early part of the Chapter, the industries producing wood, with those manufacturing products of wood and therefore dependent to a certain extent upon the forest resources, together represent various business and industrial activity of State-wide magnitude. They are industries which we could not afford to be without, and which we could therefore afford to perpetuate. In this connection a glance at the annual cut, yearly growth and present stand of the timber in Maryland is quite revealing. It is probable that the average annual increment of wood per acre for all the forests of the State cannot exceed 15 cubic feet. The total growth, upon the basis of this consumption, is 33,420,690 cubic feet; the annual cut is at present 46,949,181 cu. ft.; and the amount of timber now standing 317,871,408 cu. ft. The annual growth is but 71 per cent of the total production, which in turn amounts yearly to 15 per cent of the whole. Very little reflection or calculation is necessary to indicate that much timber is being cut faster than it is grown. It is a good deal of a certainty that the annual cut will not appreciably diminish for some time to come, and it is equally sure that under present conditions and prevalent methods the annual growth will not be greatly increased.

There is but one practical solution, and that is more efficiency in forest management, and greater care in the removal of the crop. Through the former there is little doubt that in a comparatively few year's time the production of Maryland forests might be raised 100 per cent. The Board has studied this phase of State Forestry very carefully. It has already assisted several hundred local timber owners to regulate their cut, secure sale of products and augment their production. But these hundreds should be thousands, and the Board is fully prepared to undertake such problems in every portion of the State at the instance of any woodland owner.

Better management means increased production; with increased production there will follow increase of manufacturing. Improved methods, beginning in the woodlot or larger tract of forest land, will extend and be felt through the whole field of production and operation, and with those conditions put in effect, the wood-using industries of Maryland, already of commanding importance, should steadily advance in value and give employment to even greater numbers.

TRANSPORTATION, MARKETS, AND GENERAL CONDITIONS IN THE LUMBERING AND WOOD-MANUFACTURING INDUSTRIES OF MARYLAND.

Transportation. Waterways.—Maryland's total area is 12,210 miles, of which 2,319 square miles or 19 per cent is water. The great area in waterways is made up of 1,203 square miles in the Chesapeake Bay proper, 93 in Chincoteague Bay, and 1,023 in other estuaries. From the lower end of the Chesapeake, where the Maryland State-line runs from below Somerset County, on the east, to Smith Point, Northumberland County, Virginia, on the west, it is approximately 130 miles up the center of the Bay to its end in Cecil County. It is a great waterway, the largest inlet on the Atlantic Coast of the United States. At the entrance it is 12 miles across, later broadening to an average width of 20 miles, and a maximum of 40.

The eastern and western shores of Maryland are veritably honeycombed by navigable, tide-water streams, while the Potomac river, one of the most important, follows the southern and southwestern boundaries of Maryland throughout. As far as Washington it is navigable by steam vessels, and from there by smaller boats and barges to Chain Bridge, near the District Line. These waterways give Maryland an enormous amount of deep-water transportation. They were important factors in the State's settlement, and they are as invaluable now.

Natural facilities for water transportation are also supplemented by several which are artificial. A canal, the Chesapeake and Delaware, connects the upper Chesapeake with Delaware River; another

runs from Georgetown, near Washington, to Cumberland, in western Maryland. The latter, the Chesapeake and Ohio Canal, is an old and important link in the State's waterways, for this idea, of connecting the Potomac at tide-water with the nearest point attainable to the headwaters of the Ohio, originated with George Washington before he became President. It is 185 miles in length, and fed throughout by the Potomac River.

Railroads and Highways.—There are over 1,300 miles of railway in Maryland, including the Annapolis Short Line; Baltimore, Chesapeake & Atlantic; Baltimore & Ohio; Chesapeake Beach; Cumberland Valley; Cumberland & Pennsylvania; Emmitsburg; George's Creek & Cumberland; Hagerstown & Frederick; Jennings Bros.; Maryland, Delaware & Virginia; Maryland & Pennsylvania; New York, Philadelphia & Norfolk; Norfolk & Western; Northern Central; Pennsylvania; Philadelphia, Baltimore & Washington; Washington, Baltimore & Annapolis; Washington, Potomac & Chesapeake; and Western Maryland systems.

In addition, there are 1,500 miles of State roads improved with shell, concrete, and macadam, forming main lines of traffic, and connecting all of the county seats. Facilities are ample in nearly every district not accessible by the water route, and in many parts boat and train service are combined to give adequate shipping advantages. There should not be a section of Maryland, from the truck gardens of the eastern shore to the mountain woodlands of western Maryland, which is inaccessible to the great markets near at hand.

Markets.—Maryland is a State possessing to a great degree the undoubted advantage of markets which are numerous, well distributed, and profitable. Within a radius of 190 miles of Baltimore City are New York, Philadelphia, Washington, Richmond, and Wilmington, cities which, taken with Baltimore, include more than 8 per cent of the country's total population.

It is also noteworthy that these great markets, without exception, are available by water as well as by rail. Were these advantages and the existing means of transportation not enough, the State itself has within its borders several relatively important markets and centers of distribution. Baltimore City and County, in central Maryland; Salisbury, Pocomoke City, Cambridge, Easton and others on the eastern shore; Cumberland, Hagerstown and Frederick, in western Maryland, are all centers of wood-manufacturing plants which depend, to some extent, upon local forest supplies.

Certain products, particularly in an unmanufactured state, find their way to these and other points for distribution, and lumber and lath, with cordwood and charcoal, have their greatest demand in the

larger communities. There are markets in Maryland which are available to all the forest products of the State. These markets have shown consistent growth, though still susceptible of profitable development.

FOREST PLANTING.

The forest survey of the State has shown that, excluding salt marsh land, which is practically irreclaimable, there is 11% of waste land—land that is now producing no revenue and is an expense to the owners, but which, for the most part, is suitable for forest planting. In addition there are on each of a large proportion of farms of the State a few acres of swampy, rocky or gullied hillside land that would be more profitable in forest than in pasture or other uses, or lack of use, as the case may be. There is, therefore, no lack of opportunity to practice forest planting profitably. The chief difficulties have been that planting stock could not be easily obtained, that the cost was excessive and the results uncertain, largely due to inexperience and lack of readily secured information. Most land owners are natural planters; they want to see things grow and are ready to plant trees if shown convincingly the proper plan of procedure. In the first place it was found that there was not a nursery in the State selling stock suitable for forest planting. Anyone who wanted to make a forest plantation must send to another State for his stock, and in most cases did not get the species best adapted to his needs. The results were often discouraging, and forest planting was seriously handicapped. To remedy these difficulties as far as possible, the Board of Forestry established a State Forest Nursery in the spring of 1914 at College Park, on land granted for the purpose by the State College of Agriculture. The purpose of the nursery is to grow and distribute trees at cost to residents of the State for forest and roadside planting. During the first year, after establishing the Nursery, no trees were available for planting, but during the next two years of 1915 and 1916, 130,000 trees were distributed to 92 different applicants at a cost to them of $894.07. This shows the value of a State Nursery as an agency for encouraging forest and roadside planting. All who apply are given specific advice as to what to plant and expert supervision is offered when the planter desires it, and at a nominal cost.

The objects of planting are so numerous and varied as to make this field of forestry an important and rapidly extending one. Rocky, untillable land is to be made productive, gullied hillsides are to be reclaimed, steep slopes are to be protected, stream banks are to be held against erosion, wet lands are to be made productive by basket willow growing or other planting, woodlands depleted of young growing stock by pasturing are to be thickened and brought up to full produc-

tion—these and many other problems can be solved by planting. The important highways of the State must be beautified and made as attractive as possible. Here again tree planting offers the best solution.

Comparatively little forest planting was done prior to the time that the State Forest work was organized in 1906. The records show only 5 such plantations. In 1908 the State Forester distributed small quantities of black locust and catalpa for experimental planting in various parts of the State. The stimulated interest, but little progress was made until the State Nursery was established six years later. It is estimated that a total of 550,000 young forest trees have been used to date for the reforestation of 475 acres of land in this State. Interest in forest planting is rapidly growing and the demand for State-grown stock increasing. A list of trees with prices may be obtained by applying to the State Forester, Baltimore, who will also give practical advice and help in forest planting or other forest and tree problems.

STATE FOREST RESERVES.

The State now owns in forest reservations 2,746 acres—three reserves in Garret County, and one in Baltimore and Howard Counties. They are:

Skipnish Reserve—Garrett County	888 acres
Swallow Falls Reserve—Garrett County	823 acres
Kindness Reserve—Garrett County	206 acres
Patapsco Reserve — Baltimore & Howard Counties	829 acres
Total of State Reserves	2,746 acres

The Garrett County Reserves, given to the State by Messrs. Robert and John W. Garrett in 1906, contain no merchantable timber, but a valuable stand of young growth which has been developed since the lands were cut over prior to their coming into the possession of the State. Since their acquisition, they have been patrolled by Forest Wardens to protect them from fires and trespass, with the result that the fire damage has been slight, notwithstanding extensive damage on other lands in the vicinity not systematically protected. In addition to fire protection, improvement work has been conducted on approximately 500 acres of the Skipnish Reserve, 50 acres of the Swallow Falls Reserve and over the entire 206 acres of the Kindness Reserve. This work has been in the nature of a liberation cutting to remove trees that were not of sufficient value to be taken out when lumbering operations were conducted ten years ago, but which later inter-

fered with the proper development of the younger growth.

A telephone line three miles in length has been constructed across the Skipnish Reserve to the lookout station at Stem Rock on Snaggy Mountain, which overlooks the State lands, and thence along Snaggy Mountain to Point Lookout, another observation station near a forest warden's headquarters. This line is connected with the farming settlements nearby, enabling the lookout watchman to summon assistance quickly in case of forest fires on the State's property or in the vicinity. In addition, a fire line has been constructed along the West Virginia-Maryland State boundary for a distance of one mile, to aid in checking forest fires that originate in West Virginia and threaten State and private lands in Maryland.

The Patapsco Reserve, consisting of lands purchased by the State under an appropriation of $50,000 made by the Legislature of 1912, supplemented by lands given by Messrs. John M. Glenn, William L. Glenn, Richard C. Norris, and Rollin Norris, lies along the Patapsco River in Baltimore and Howard Counties, between Avalon and Hollofield. This Reserve includes some of the most picturesque points along the Patapsco. The lands, for the most part, are well wooded, some of them heavily timbered, and it is the purpose of the Board to maintain them as a natural forest. In addition to the lands owned by the State in this region, a plan of co-operation between the private owners of land held for water rights, and the State Board of Forestry, is in effect, covering 1,038 acres, which gives the State the use of the land for park purposes in return for its protection in the matter of patrol against fire and tresspass.

Several miles of trails have been constructed, a small amount of forest planting has been done, and through the co-operation of the Baltimore & Ohio Railroad Company several miles of fire line have been constructed adjacent to the railroad. It is the purpose of the Board of Forestry to make these lands available as a pleasure ground, under reasonable regulations, for all those in the State who wish to use them.

The Patapsco area is not only one of great natural attractiveness, being so near Baltimore that its use as a recreation ground is certain to be more fully appreciated, but it is also important to protect the watershed of the Patapsco River, which plays such an important part in furnishing water power for several industrial enterprises. Between Relay and Alberton, a distance of 11.4 miles, there are 10 water power developments, 8 of which are now in operation. The power for these plants is furnished by the Patapsco River, and its value for that purpose is measured by the evenness of flow and freedom from silt. A forest cover is essential to maximum efficiency in regulating flow, and

PLATE VII. FIG. 1.—A PORTABLE MILL.

There are in excess of 700 portable mills operating in the forests of Maryland, and moving from place to place as timber supplies are found.

PLATE VII. FIG. 2.—A BAND MILL.

Working where timber is plentiful, such mills are very efficient, with a daily cut more than ten times as great as that of the portable mill.

in preventing erosion with its deposits of sediment. The steep slopes along the river that have been cultivated in years past have largely contributed to the accumulation of silt which has collected behind the dams built for storage purposes and has clogged the river channels, increasing the frequency of floods, and carrying immense quantities of silt into the upper Patapsco near Baltimore, requiring the expenditure of large sums of money for dredging. A very informing illustration of the silt accumulation is shown by the accompanying cut, taken from a photograph along the Patapsco River in front of a dam that had been in use but ten years. This mass of sediment, extending for a quarter of a mile along the river bed, represents but a small part of the surface erosion from cultivated lands along the steep banks of the Patapsco in ten years' time.

The only remedy is to get these steep hillsides under a forest cover as quickly as possible, which is one of the objects of the State in acquiring the lands now in the Patapsco Reserve.

MUNICIPAL FORESTS.

Some of the cities of the State have acquired forest lands in the vicinity of their water supplies for protection purposes. The management of these lands has become a distinct problem of municipal forestry. There are two notable examples of municipal forest ownership in the State, one, the City of Baltimore, the other, the City of Frederick. Other towns and cities have small holdings of land around their reservoirs, but not of sufficient acreage to be designated as municipal forests.

Baltimore City has acquired appoximately 5,000 acres about its city reservoir at Loch Raven, in Baltimore County, of which 1,000 acres is submerged, 2,000 acres wooded and 2,000 acres is in cleared fields. Of the latter, 250 acres have been recently planted in small forest trees, and it is the plan of the City to continue forest planting each year until the remaining cleared land is entirely planted and supporting a forest growth. The aim is to bring as rapidly as possible all open land under a forest cover to prevent soil erosion and silting of the reservoir, and at the same time to make the resulting forests a source of revenue as well as of scenic beauty.

Frederick.—The city of Frederick has likewise acquired a municipal forest of approximately 1,200 acres, covering a part of the mountain watershed from which its water supply is derived. It is planned to make further purchases for the same purpose. While this forest is principally for protection, it should also be a source of revenue as a forest. This was shown by the forest survey made by the State Board of Forestry prior to its purchase. The Board of Forestry is

co-operating with the City of Frederick in the management of these lands. There is nothing of greater importance to the health and prosperity of cities and towns than an abundant supply of pure water. This is being recognized and means are being devised to secure it. One of the prime requisites is as complete control as possible over the watershed from which the water supply is derived. Complete control is seldom practicable, but the acquisition of at least the immediate surroundings of the reservoirs is imperative. It has been fully demonstrated that a forest cover for a watershed is the best of all to insure freedom from silt, to prevent polution, and to conserve the fullest amount of the precipitation. Such forests properly handled are a source of revenue without reducing their value for watershed protection. Hence the municipal forest should become popular with cities and towns, especially where mountain water supplies are possible.

THE STATE'S FOREST AREAS.

Classified by Stand of Timber Per Acre.

COUNTY	Mixed Hardwoods			Pine			Hardwood and Pine		
	Over 5,000 Bd. Ft. Acres	Under 5,000 Bd. Ft. Acres	%	Over 5,000 Bd. Ft. Acres	Under 5,000 Bd. Ft. Acres	%	Over 5,000 Bd. Ft. Acres	Under 5,000 Bd. Ft. Acres	%
Allegany	174	128,148	78	6	3,158	2	442	31,904	20
Anne Arundel..	6,744	61,178	74	8,430	9,085	19	.....	6,829	7
Baltimore	4,301	94,659	96	601	144	1	.....	3,810	3
Calvert	8,251	39,489	76	40	10,482	17	.....	4,128	7
Caroline	1,861	19,775	34	1,825	19,206	34	.....	20,167	32
Carroll	3,532	35,401	99	.....	.....	...	.....	359	1
Cecil	2,738	50,805	100	.....	.....	...	.....	.....	...
Charles	6,868	66,037	43	5,243	13,609	11	.....	79,790	46
Dorchester	2,458	16,395	14	8,182	40,582	35	27,115	43,559	51
Frederick	3,300	87,358	99	.....	62	...	.....	397	1
Garrett	4,484	264,112	98	1,464	617	1	2,529	1,277	1
Harford	6,303	75,234	99	.....	335	1	.....	.....	...
Howard	9,399	27,709	96	.....	1,536	4	.....	.....	...
Kent	6,787	26,063	97	.....	443	1	.....	483	2
Montgomery ..	4,823	59,416	94	272	2,806	4	.....	1,504	2
Prince George's	2,122	89,124	72	.....	23,755	18	.....	12,199	10
Queen Anne's..	.....	55,359	94	166	1,840	3	31	1,874	3
St. Mary's	1,471	35,496	31	1,919	22,030	20	.....	58,164	49
Somerset	.....	7,101	10	7,896	20,843	42	5,601	26,946	48
Talbot	441	8,251	19	6,942	5,185	26	1,573	23,430	55
Washington ...	4,022	56,160	83	.....	599	1	.....	11,493	16
Wicomico	112	24,852	23	7,018	35,596	38	1,270	42,760	39
Worcester	15,869	18,241	22	7,902	77,387	59	.....	28,783	19
The State	96,060	1,346,363	65	57,906	289,300	15	38,561	399,856	20

THE FORESTS OF MARYLAND.

By Counties.

In the forest survey of the State every tract of woodland of 5 acres or more was sketched on a topographic base map, on a scale of one mile to the inch, and its general characteristics noted. The hardwood stands were divided into three general classes—sapling, culled and merchantable—all shown in red on the forest maps, but also indicated by different arrangement and symbols.

The sapling class represents the young stands too small to furnish a commercial product; the culled class, stands that have either been culled or are so immature that logging operations under ordinary conditions would not be justified. The culled class is divided into three sub-classes, according to relative stand of saw-timber per acre. The marchantable class represents the hardwood stands containing the heavier stands of timber where logging is justified and, as in the culled class, three sub-classes are made to indicate the relative stand per acre.

The pine areas in green on the forest maps are classified by species, using an initial letter, and as to size of trees into six classes, indicated by symbols. Mixtures of hardwood and pine are shown on the forest maps by combinations of red and green, the relative composition and stand of timber by appropriate characters. A forest map will be found in connection with the forest description of each county.

ALLEGANY COUNTY.

Allegany, next to the westernmost county of Maryland, extends along a narrow stretch of mountain land north of the Potomac River, which forms its southern boundary. From the River, near Cumberland, it is about five miles to the Pennsylvania line, and where Allegany joins Washington County on the east, it is only six. But at its western end the county broadens to a width of nearly twenty miles. In point of size it stands fourteenth in the State, but its forested area is second only to that of Garrett.

A succession of prominent ridges 1,000 to 2,500 feet in altitude extend in a northeasterly and southwesterly direction from the Pennsyl-

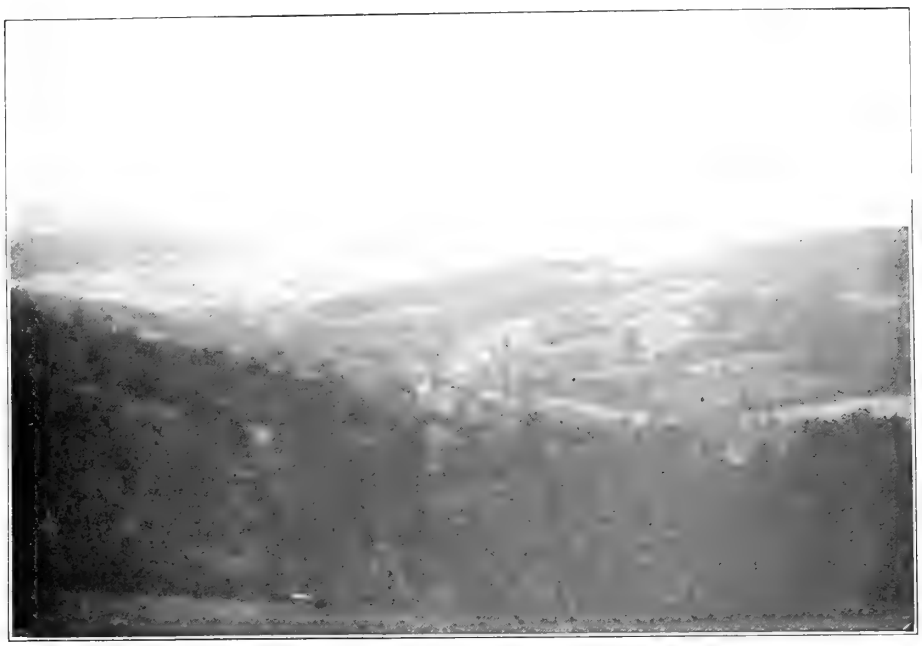


PLATE VIII. FIG. 1.—THE FORESTED WATERSHED.

In the Catoctin Mountains of Frederick County, heading an important system of municipal supply, this portion of the watershed is nearly ideal. It should be kept so.

PLATE VIII. FIG. 2.—FROM A DEFORESTED WATERSHED.

Removal of the original forest cover on the surrounding slopes and hills has permitted great accumulations of silt to seriously interfere with continued power-production at this point on the Patapsco River.

vania line to the Potomac River, which receives the entire drainage of the county. Various soils occasion several forest types—shales predominating in the eastern three-quarters of the county, forming the shallow upland soil where most of the forest growth occurs; on some of the higher ridges, limestone, resulting in land well suited to agricultural and horticultural development; along Dan's Mountain and to the west, other soils, made up largely of sandy loam, giving a tree growth superior to that occurring on the other soil formations.

THE FORESTS.

Sixty-two per cent of the county's area is wooded. Of this, not greater than one per cent is virgin forest, the remaining ninety-nine per cent having been cut over once, if not several times, since the settlement of the county about one hundred and fifty years ago. At that time virgin woodland covered probably ninety-five per cent of the county's total area. The present land in forest has been cut over and burned repeatedly, so that its original character has been very greatly changed. At the same time the quest for valuable kinds of wood has led to a systematic culling of the forests throughout accessible regions, with a consequent reduction of merchantable material. This area of forest is being still further reduced by the extensive clearing of land for fruit growing in the eastern section of the county, and it is to be expected that forests will be cleared away for farm crops on small areas in other sections. Excessive cutting and fires have almost eliminated in places certain species that were of the greatest value years ago, so that a normal balance cannot be restored except through radical changes in prevalent methods of logging, protection, and management.

Existing forests may be divided into three classes: hardwood, pine, and a mixed growth of each. Hardwood forests cover 128,322 acres, or seventy-eight per cent of the wooded area; pine stands, including a small amount of hemlock, are found on 3,164 acres, two per cent of the forested area; while the mixed hardwood and pine forests cover 32,346 acres, or twenty per cent of the wooded area. In the total stand of saw timber the hardwood forests contain 105,369,000 board feet, and the pine 42,073,000, the stumpage found in mixture being combined with these two other main classes. According to the forest survey of 1909 there were only 174 acres of hardwoods in the county having a stumpage of 5,000 feet or more to the acre, and 128,148 acres containing less; pine of 5,000 board feet or greater occupied 6 acres, and less than this, 3,158; while mixed stands of pine and hardwood covered 442 and 31,904 acres, respectively, of over 5,000 and less than 5,000 board feet.

The pines, of which there are four species—white, pitch, table mountain, and scrub—are confined almost altogether to the eastern half, where mixtures of the hardwoods with pine, to a lesser extent with hemlock, also occur. Further westward these mixed stands are found less frequently, until beyond Cumberland and along the Garrett County line the forest cover is almost exclusively mixed hardwood growth. These various forests show three types, a lower slope, an upper slope, and a ridge type. White oak, sugar maple, basswood, beech, red oak, ash, and more sparingly hemlock and white pine, characterize the first and most important type. The leading species of the upper slopes are chestnut, hickory, black birch, red and black oaks, and scrub pine. The last and poorest type, on the ridges, shows chestnut oak, with pitch and table mountain pines.

USES OF THE FORESTS.

The uses of the Allegany County forests are indicated to some extent by the three types which characterize their occurrence and growth. The woodland on the lower slopes produces the bulk of the saw timber; the upper, crossties and other small material; the ridge, ties (railroad and mine), tanbark and props. The annual cut of lumber in the county is not nearly so great as it was a decade ago, but is still an industry of considerable importance, and one now largely kept alive by a wide use of the portable mills that are easily removed from place to place in search of merchantable material. Altogether, Allegany County has forty-five sawmill and timber operators, nearly all with mills of the portable kind, and though their individual cut is relatively small, these operators, as a whole, have an annual production somewhat in excess of 3,000,000 cubic feet. The 45 miles of railway in the county, as well as the line which follows the southern boundary, are important adjuncts to the local timber industry. Allegany does not manufacture a great amount of wood. Lonaconing, Midland, Ellerslie, Frostburg, Mt. Savage, and Cumberland have retail yards or planing mills which work and sell lumber, from Maryland and West Virginia, to the local trade. In Cumberland alone there are nine planing mills and manufacturers of planing mill products, but other than this, and the large pulp paper mill at Luke, local forest industries are those of production rather than of manufacture.

The chief forest products in order of their relative value and importance to the county are lumber, mine props, tanbark, crossties, poles, lath, pulpwood, shingles, and posts. There is a good market in supplying the coal mines in the western section of the county with

props, pit-ties, and timber; the railroad companies with crossties; and the telephone and telegraph companies with poles. Prices for these products are advancing, and there is a certainty of good returns from such forest lands as are properly protected and more conservatively managed. Growing industries demand an abundant supply of forest material, and the production of local woodlands must be maintained to supply their needs. The county, instead of being a heavy importer of lumber, mine props and other material, should be exporting large amounts of them. The forest area is sufficient and of suitable character for a continued production of $1,000,000 worth of material, annually, compared with that of $440,754 at the present time.

ALLEGANY COUNTY.

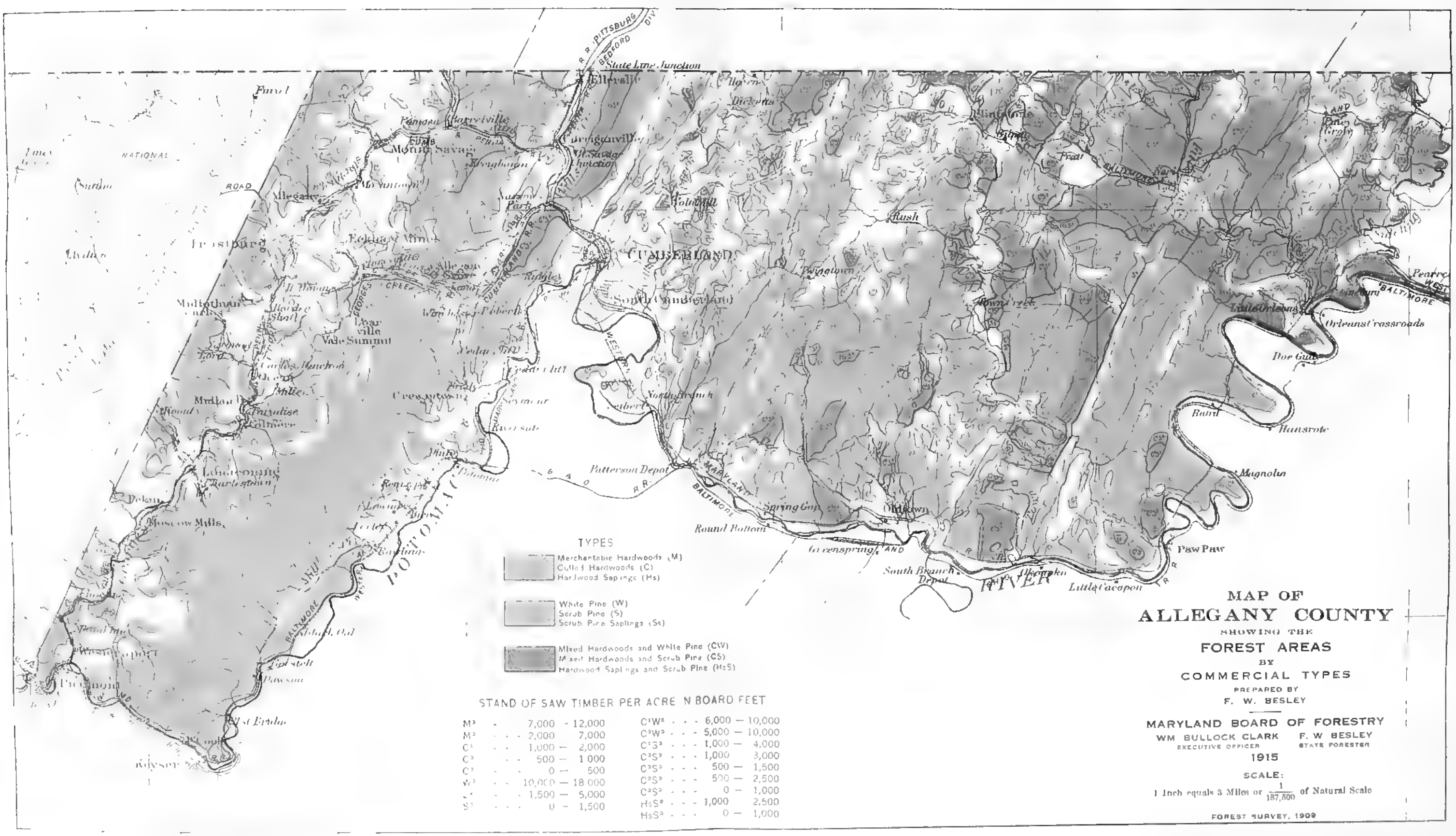
SUMMARY OF THE LUMBER AND TIMBER CUT.*

Product.	Amount.	Unit Value.†	Total Value.
Lumber: Hardwood	9,175,000 Bd. Ft.	$18.00 per M	$165,150
Softwood	7,015,000 Bd. Ft.	15.00 per M	105,225
Pulpwood	500 Cords	6.00 per Cord	3,000
Railroad Ties	47,000	.55 each	25,850
Cordwood	3,500 Cords	3.00 per Cord	10,500
Mine Props	27,000 Tons	2.50 per Ton	67,500
Tan Bark	4,200 Tons	9.50 per Ton	39,900
Poles	4,000	2.75 each	11,000
Shingles	215,000	4.25 per M	914
Lath	1,028,000	3.75 per M	3,855
Mine Ties	50,000	.15 each	7,500
Posts	2,000	.18 each	360
The County	3,141,400 Cubic Feet		$440,754

* Products in order of their importance. † At point of production.

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $3.50 per M.	Pine $4.00 per M.	Total $
1	40,877	29,424	72	10,872	16,109	26,981	$38,052	$64,436	$102,488
2	36,774	22,008	60	7,894	8,183	16,077	27,629	32,732	60,361
3	44,190	28,407	64	15,297	8,108	23,405	53,539	32,432	85,971
4	185	44	24	10	.....	10	350	.....	350
5	5,480	2,346	43	2,981	6,257	9,238	10,434	25,028	35,462
6	8,960	5,562	62	2,823	3,474	6,297	9,880	13,896	23,776
7	18,682	13,395	66	11,251	.....	11,251	39,379	.....	39,379
8	11,994	8,737	73	5,971	.....	5,971	20,898	.....	20,898
9	3,805	1,183	31	1,056	.....	1,056	3,696	.....	3,696
10	2,877	1,071	37	841	.....	841	2,944	.....	2,944
11	1,526	885	58	1,089	.....	1,089	3,811	.....	3,811
12	2,024	355	17	499	.....	499	1,747	.....	1,747
13	16,378	8,439	50	9,816	123	9,939	34,356	492	34,848
15	5,281	3,842	72	3,400	.....	3,400	11,900	.....	11,900
16	18,800	11,340	60	2,735	176	2,911	9,572	704	10,276
17	6,539	4,752	72	4,676	.....	4,676	16,366	.....	16,366
18	4,521	2,217	49	1,870	.....	1,870	6,545	.....	6,545
19	1,812	885	49	858	.....	858	3,003	.....	3,003
20	6,134	4,826	78	4,822	157	4,979	16,877	628	17,505
21	12,175	5,622	47	6,298	8,891	15,189	22,043	35,564	57,607
22	4,390	1,313	30	1,609	284	1,893	5,632	1,136	6,768
23	2,516	1,363	26	1,510	311	1,821	5,285	1,244	6,529
24	3,587	1,239	31	1,323	.....	1,323	4,630	.....	4,630
25	1,582	879	55	879	.....	879	3,077	.....	3,077
26	1,575	1,108	70	2,864	.....	2,864	10,024	.....	10,024
27	3,363	2,410	39	1,962	.....	1,962	6,867	.....	6,867
28	336	181	54	163	.....	163	571	.....	571
The County	266,363	163,832	62	105,369	42,073	147,442	$369,107	$208,292	$577,399


MAP OF
ALLEGANY COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
EXECUTIVE OFFICER
F. W BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1909
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
White Pine (W)
Scrub Pine (S)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and White Pine (CW)
Mixed Hardwoods and Scrub Pine (CS)
Hardwood Saplings and Scrub Pine (HsS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M - 7,000 - 12,000
M - 2,000 7,000
C - 1,000 — 2,000
C - 500 — 1 000
C - 0 — 500
W - 10,000 — 18 000
- 1,500 — 5,000
S - 0 — 1,500
C W - 6,000 — 10,000
C W - 5,000 — 10,000
C S - 1,000 — 4,000
C S - 1,000 3,000
C S - 500 — 1,500
C S - 500 — 2,500
C S - 0 — 1,000
HsS - 1,000 2,500
HsS - 0 — 1,000
State Line Junction
Ellerslie
Corriganville
Mount Savage
Barrelville
Frostburg
CUMBERLAND
South Cumberland
Rush
Twiggtown
Little Orleans
Orleans Crossroads
Doe Gully
Hansrote
Magnolia
Paw Paw
Little Cacapon
Patterson Depot
Round Bottom
Spring Gap
Oldtown
South Branch Depot
POTOMAC
RIVER
NATIONAL
ROAD
BALTIMORE
Lonaconing
Westernport

ANNE ARUNDEL COUNTY.

Anne Arundel is the northernmost county of "southern Maryland." It lies wholly within the coastal plain area, and partakes of the general nature of the coastal plain soil formation. Since the northwestern part of the county lies adjacent to the Piedmont region, the indigenous plant and tree life are in part characteristic of the Piedmont, and partly of the coastal plain types. The main physical features of the county are a succession of low, rounded hills and deep ravines, particularly in the northern two-thirds of the county; a large per cent of sandy soil, and a long waterfront adjacent to Chesapeake Bay on the east, the South River, the Severn and the Magothy forming deep indentations from the Bay; and the Patuxent River extending along almost the entire western boundary.

The Forests.

The wooded area of the county consists of thirty-four per cent of the total land area, with a greater amount of woodland in the central and north-central parts of the county than is found in the southern and extreme northern parts, where the land is more generally cultivated. The most notable feature of forest distribution is that the woodlands are invariably found along ravines and streams, occasionally extending back upon the higher lands. The soil is usually very light, and washes badly on steep slopes, so that the forests along these streams and hollows are in reality *protection forests,* although serving at the same time for the production of timber.

The county's wooded areas have been continually reduced, and are now confined in large part to non-agricultural situations. As a rule, the woodlands are in small, irregular patches which are almost exclusively the property of farmers. Originally, this county was practically covered with forests of hardwoods, with which were intermingled small stands of pine. As the population increased, and the settlements advanced from the watercourses, the first forests rapidly diminished in area until about fifty years ago, when the turning-point was reached, and since that time more land has grown up in forests than has been cleared. As a rule, pine forests represent the land that was once cleared for crops, and later on abandoned; the light-seeded pines quickly took possession of such areas, and the age of the resulting

forests is a good index of the time when such lands ceased to be cultivated.

Existing forests are largely of the hardwood type, consisting of oaks, chestnut, hickory, gum, tulip poplar, maple, and a variety of others in varying proportions. The gum, particularly the red or sweet gum, is found on the moist soils usually associated with maple, black gum and beech, while the yellow poplar and the more valuable oaks occur on the lower slopes, chestnut generally occupying the higher and dryer situations. Pine stands comprise only 19 per cent of the total wooded area, there being but two kinds of pine in the county, the very common scrub, or spruce pine, and the pitch pine, often described as foxtail pine. Stands of hardwood include 74 per cent of the total area in woodland, with the remaining 7 per cent in mixed stands of hardwood and pine. On the 92,266 acres of forest land there is a stand of 128,517,000 board feet of saw timber. Hardwood timber amounting to 5,000 or more board feet per acre occupies 6,744 acres, and hardwoods of less than that, 61,178 acres; pine stands of 5,000 feet or more represent an acreage of 8,430, and less than this, 9,085; while mixed stands of each, all of them less than 5,000 feet per acre, cover 6,829 acres.

USES OF THE FORESTS.

It is estimated that the number of persons finding continuous employment in the forest industries of Anne Arundel county is about 375, or a proportionately greater number for shorter periods of time, and that these several industries represent capital invested of $400,000. Raw products sold are valued at $130,099, and those manufactured at $60,000 more. The producers give employment to about three-fourths of the total labor employed, and represent about one-half the total capital. They are well distributed over the entire county, but the manufacturers are restricted to two districts, Annapolis and Brooklyn.

Producers of wood comprise twenty-two timber operators, a few getting out ties, telephone poles, piling and special products, but the majority of them cutting lumber. There are six sawmills which may be classed as permanent or stationary, and the remainder are the small portable mills, which move about from place to place, cutting timber where they can find it. The operators send their products over the 88 miles of railroad in the county to nearby inland points, or market them via the water route in New York, Philadelphia and Baltimore. In the City of Annapolis there are four firms which deal in lumber, handle builders' supplies and do manufacturing of such general planing mill products as sash, doors and blinds, and at Brook-

lyn, East Brooklyn and Curtis Bay are two yards, a box factory and a large car and foundry manufactory. The lumber and timber cut disposes annually of 1,099,610 cubic feet of wood, while so-called wood-using industries require yearly more than 1,500,000 cubic feet. Of this last, 11 per cent is locally produced, showing that in the markets for Anne Arundel county wood there is opportunity for some development.

The cut from the present forested area exceeds the growth by 86.8 per cent; salable wood and timber in different forms brought $130,099 to county residents in the year 1914, while other products not sold but used at home were worth as much or more to the farmers who were the chief users. With practical, up-to-date methods of agriculture extended to include the woodlot, present revenues may be increased and assured. Right handling may double present production, but without such care the returns from the sale and use of forest products will manifest a steady decrease. The present area of forest land will be reduced, as it should be, by the clearing of land which may grow good crops, but it should in every case be offset by better management, and the reforestation of some, at least, of the 42,000 acres of Anne Arundel soils now classed as waste.

ANNE ARUNDEL COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	1,596,000 Board Feet	$18.00 per M	$28,728
Softwood	370,000 Board Feet	15.00 per M	5,550
Pulpwood: Pine	1,700 Cords	6.00 per Cord	10,200
Poplar and Gum	500 Cords	7.00 per Cord	3,500
Railroad Ties:			
White Oak	15,894	.70 each	11,125
Mixed Oak	15,884	.50 each	7,942
Chestnut	32,116	.20 each	6,423
Piles	180,000 Lineal Feet	.10 per Foot	18,000
Cordwood	2,700 Cords	3.25 per Cord	8,775
Mine Props	200 Tons	2.50 per Ton	500
Poles	5,175	3.00 each	15,525
Shingles	225,000	4.25 per M	956
Posts	10,500	.15 each	1,575
Export Logs	210,000 Board Feet	30.00 per M	6,300
Charcoal	50,000 Bushels	.10 per Bushel	5,000
The County	1,099,610 Cubic Feet		$130,099

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.50 per M.	Pine $5.00 per M.	Total $
1	46,200	9,401	20	16,342	391	16,733	$73,539	$1,955	$75,494
2	49,500	20,290	41	26,309	1,087	27,396	118,390	5,435	123,826
3	60,610	26,100	43	25,280	718	25,998	113,760	3,590	117,350
4	54,700	25,472	46	21,756	3,814	25,570	97,902	19,070	116,972
5	24,290	5,400	22	17,769	175	17,944	79,961	875	80,835
6	39,200	5,603	14	14,858	18	14,876	66,861	90	66,951
The County	274,500	92,266	34	122,314	6,203	128,517	$550,413	$31,015	$581,428

BALTIMORE COUNTY.

Baltimore County is in the north-central portion of the State, adjacent to Baltimore City, and extends northward to Pennsylvania. The Gunpowder River and the Little Gunpowder form three-fourth's of the county's eastern boundary, the Patapsco the southern and half of the western boundaries. With the exception of a small portion of the southeastern part, which lies in the Coastal Plain Division, the county is in the Piedmont Plateau. That portion in the Coastal Plain is somewhat flat, generally sandy as to soil, and in other ways characteristic of the tidewater regions; while the remainder of the county consists of rolling land gradually increasing in elevation toward the north. Nearly all is well adapted to dairying and general farming, and while most of the county is very suitable for agriculture, there are certain rich, extensive valleys which constitute especially the principal farming centers—the Green Spring, Dulaney, Worthington, and Long Green Valleys being the most important of these.

The Forests.

Of the county's total land area, 24 per cent is woodland, and with the exception of the farming valleys named above the forests are quite evenly distributed. There are few extensive wooded areas, the forests being principally confined to woodlots which vary from 10 to 100 acres in extent. The value of the land for farming purposes precludes the use of most of it for forest, and large continuous bodies of woodland are rare except in the lower eastern section of the county. Here, adjacent to Back and Middle Rivers, and the Gunpowder, occur considerable areas of hardwood forests, together with smaller tracts of mixed hardwoods and pine. The few pure stands of scrub pine, the only conifer common to the county, are found here also, and as a whole the tidewater section is well forested.

While there is little pine timber in Baltimore County, there is much valuable hardwood growth—white, red, scarlet, and black oaks, tulip poplar, hickory, chestnut, ash, and black walnut. In northern Baltimore county the forests are largely of chestnut, and here, since its beginning in Maryland, the blight has made serious inroads. Hardwoods constitute 96 per cent of the whole wooded area, pure pine 1

per cent, mixed stands of each 3 per cent. It was shown by the survey of 1910 that there are 4,301 acres of mixed hardwood which contain 5,000 board feet or more per acre, and 94,659 acres containing hardwood stands of less than 5,000 feet; on the pine lands there are stands of 5,000 feet or more on 601 acres, and of less than this on 144; while mixed hardwood and pine are all less than 5,000 feet to the acre, with a total area of 3,810 acres.

USES OF THE FORESTS.

The cut of approximately 30 mills in Baltimore County, most of them of the portable kind, supplemented by that of numerous individual timber operators, many of them with woodlots of their own, amounted in 1914 to 2,119,584 cubic feet of wood, with a value at points of production of $308,186. Of this, of course, lumber represented the major part, followed by railroad ties, poles, pulpwood, cordwood, piling, export wood, shingles, fence posts, tanbark, mine props, and lath. Baltimore County has the greatest mileage in railway lines of any county in the State. One railroad follows the southwest border for about 18 miles; there are 111 miles of five different lines in the county itself; and a large additional mileage in the electric lines which extend from Baltimore City in all directions. The result is a large demand and a good price for railroad ties, and as these are a product for which the county has many suitable woods, the cutting of cross-ties is an important local industry. There is enough chestnut in the county, and a sufficient number of pole-lines, to make poles a considerable product, while cordwood is characterized by a heavy demand and a profitable market. Convenient railway lines and extensive highways in an improved condition make practically all of the county's forests accessible for remunerative logging operations.

There are a total of eight retail yards located in the county at some distance from Baltimore City—Towson, Upper Falls, Arlington, Lauraville and Evergreen, all having one or more, in some cases with a small planing mill in connection for doing custom work. Within a few miles of the center of Baltimore are located the State's most important wood-using industries, in all nearly two hundred firms which use or handle wood in some form, and which are of incalculable benefit to the county in the way of products sold and wages paid.

The woodlands are, for the greater part, well tended and carefully protected. Many of them form parts of large estates, and while their management may be guided as much by aesthetic as by commercial tastes, it is still a desirable condition for the county. There are resident Forest Wardens in practically every wooded section, and it has

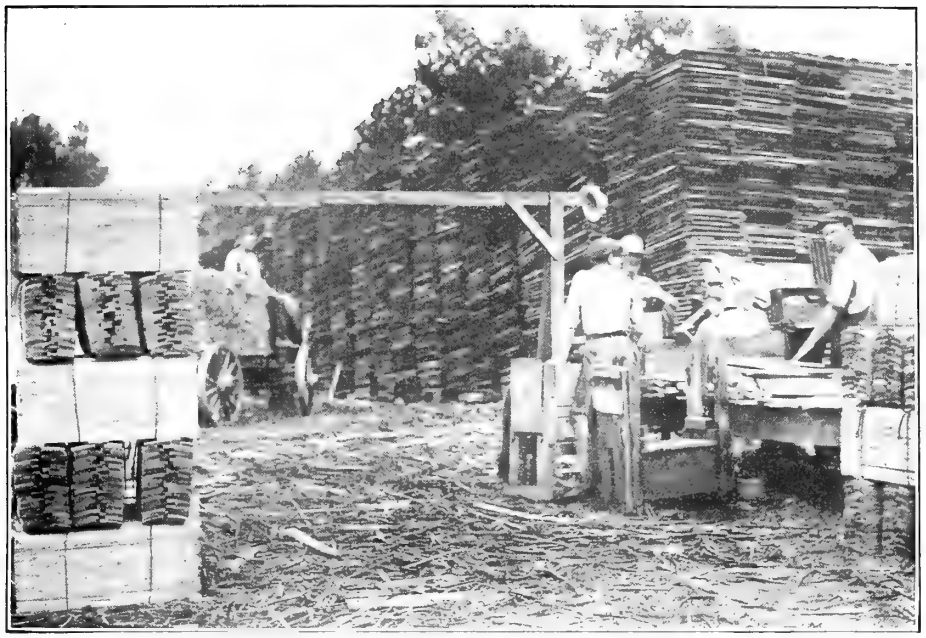


PLATE IX. FIG. 1.—KEG STAVES FROM CHESTNUT.

A Central Maryland industry, it offers another way for successful utilization of blighted trees. The chestnut stave is wear-resistant in service.

PLATE IX. FIG. 2.—RED OAK FOR CHAIR STOCK.

Large sizes in this red oak lumber, a high-grade product, are sawed and saved for dimension; smaller pieces are cut up by the portable mill for chair leg stock, this method giving excellent utilization.

of late years been possible for them, through the general co-operation of local woodland owners, to reduce to a minimum the damage from forest fires. Land values in this county are high, and owners of forest cannot afford to manage that property with less care and skill than they must give to other portions of their estates and farms. The cut now about equals the growth, and present excellent conditions continuing, there is no reason why a considerable revenue may not always be taken from Baltimore County's woodlands.

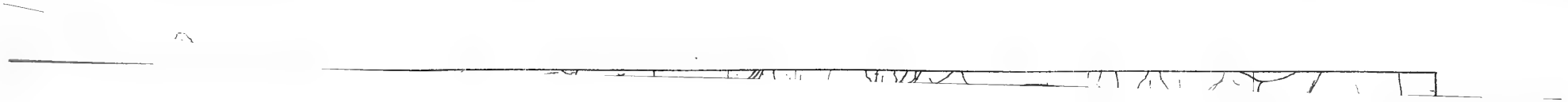
BALTIMORE COUNTY.

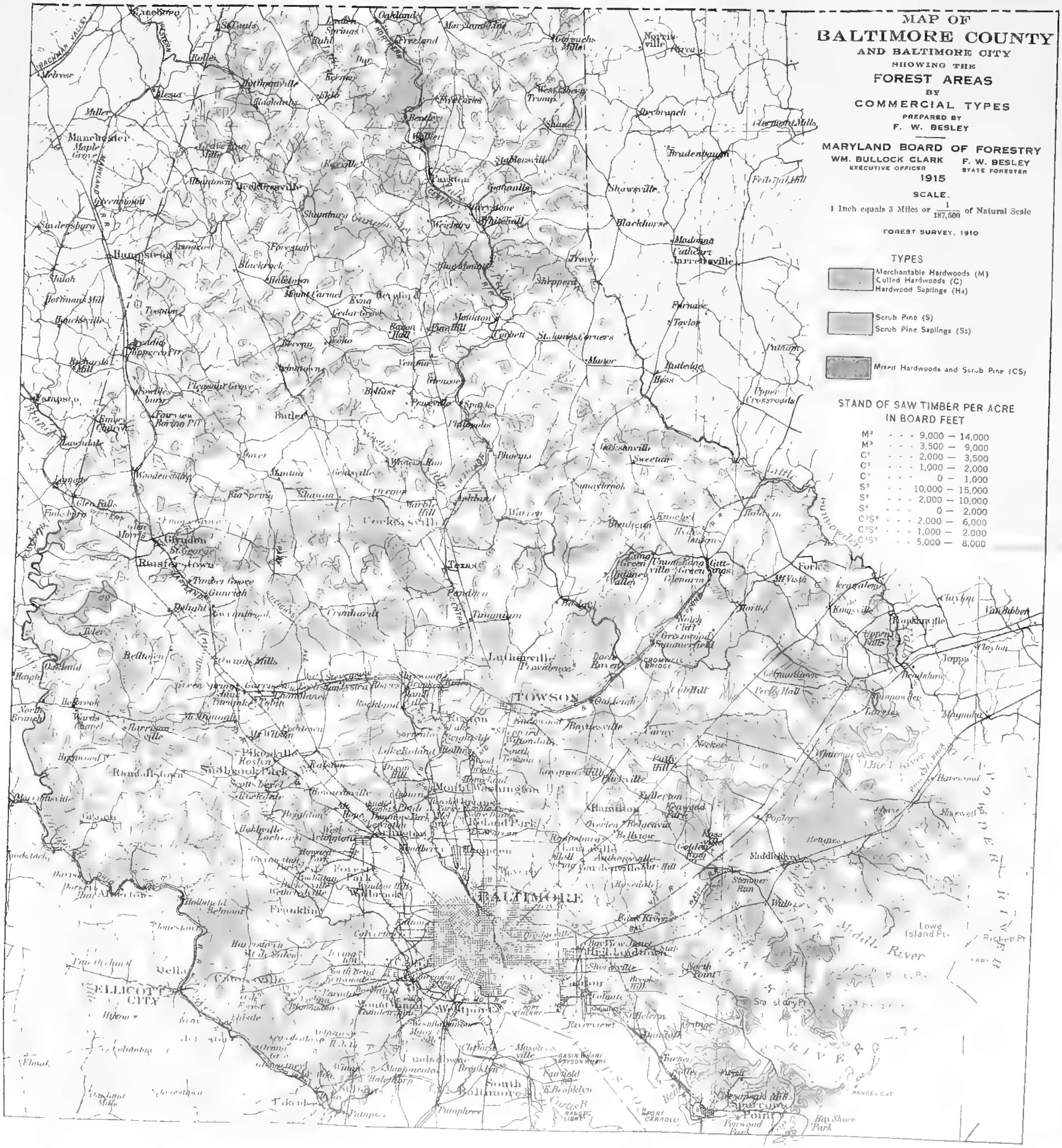
SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	8,570,000 Board Feet	$18.00 per M	$154,260
Softwood	100,000 Board Feet	15.00 per M	1,500
Pulpwood: Pine	1,000 Cords	6.00 per Cord	6,000
Poplar and Gum.	1,750 Cords	7.00 per Cord	12,250
Railroad Ties:			
White Oak	33,050	.65 each	21,482
Mixed Oak	59,376	.45 each	26,719
Chestnut	49,893	.20 each	9,979
Piling	158,000 Lineal Feet	.10 per Foot	15,800
Cordwood	4,600 Cords	3.50 per Cord	16,100
Mine Props	150 Tons	2.50 per Ton	375
Tan Bark	70 Tons	8.50 per Ton	595
Poles	11,175	3.00 each	33,525
Shingles	750,000	4.25 per M	3,187
Lath	25,000	3.25 per M	81
Posts	18,420	.15 each	2,763
Export Logs	119,000 Board Feet	30.00 per M	3,570
The County	2,119,584 Cubic Feet		$308,186

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $
1	17,460	5,164	30	8,529	24	8,553	$42,645	$120	$42,765
2	28,750	8,744	29	18,497	.....	18,497	92,485	.....	92,485
3	20,820	4,820	23	11,241	36	11,277	56,205	180	56,385
4	37,580	8,624	23	20,841	155	20,996	104,205	775	104,980
5	28,290	4,487	16	10,145	396	10,541	50,725	1,980	52,705
6	22,870	7,089	31	8,475	.....	8,475	42,375	.....	42,375
7	52,670	8,142	15	10,485	56	10,541	52,425	280	52,705
8	41,273	9,207	22	24,330	.....	24,330	121,650	.....	121,650
9	23,370	5,160	22	14,333	.....	14,333	71,665	.....	71,665
10	30,980	6,120	20	14,325	.....	14,325	71,625	.....	71,625
11	42,930	14,413	34	30,427	1,152	31,579	152,135	5,760	157,895
12	8,180	873	11	668	.....	668	3,340	.....	3,340
13	9,178	1,186	13	1,525	.....	1,525	7,625	.....	7,625
14	14,180	3,087	27	4,696	102	4,798	23,480	510	23,990
15	23,650	16,399	69	22,835	6,070	28,905	114,175	30,350	144,525
The County	403,181	103,515	24	201,352	7,991	209,343	$1,006,760	$39,955	$1,046,715





MAP OF
BALTIMORE COUNTY
AND BALTIMORE CITY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
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1915
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1 Inch equals 3 Miles or $\frac{1}{187,500}$ of Natural Scale
FOREST SURVEY, 1910
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine (S)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M^2 - - - 9,000 — 14,000
M^3 - - - 3,500 — 9,000
C^1 - - - 2,000 — 3,500
C^2 - - - 1,000 — 2,000
C^3 - - - 0 — 1,000
S^2 - - 10,000 — 15,000
S^3 - - - 2,000 — 10,000
S^4 - - - 0 — 2,000
C^2S^3 - - - 2,000 — 6,000
C^2S^4 - - - 1,000 — 2,000
C^3S^2 - - - 5,000 — 8,000
BALTIMORE
TOWSON
ELLICOTT CITY

CALVERT COUNTY.

Calvert, the smallest County in the State, is one of the group of southern Maryland Counties lying between the Chesapeake Bay on the east and the Patuxent River on the west. The County's chief topographic feature is a ridge which extends from north to south, of which the greatest elevation is 200 feet, from that sloping down to the Patuxent on one side and Chesapeake Bay on the other. The greater part of the drainage is westward to the Patuxent River, which is navigable along the County's entire border. The local soil is for the most part light, sandy loam, though ranging from pure sand along the shore line to a clay loam in the east-central part.

The Forests.

The County's present wooded area amounts to 45 per cent, and since this region has been settled for longer than 250 years the present line of demarkation between forest and farm has become clearly defined. Of the three classes of forest shown on the map—hardwood, pine, and mixed hardwood and pine—there are certain sub-divisions growing out of the many variations of topography and soil. At present the forests which comprise nearly half the land area are rather uniformly distributed along the streams and ravines, where they follow the drainage contours closely. The light soil is subject to erosion wherever steep slopes occur, and consequently experience has shown that such lands are best retained in forest. As these slopes and stream beds constitute a large percentage of the total area, it is likely that nearly all of the present forested areas will be continued in forest. Indeed, for the past forty years, more land, once deforested, has been allowed to naturally revert to pine than has been newly cleared during that period. The Patuxent River side of the County has the larger percentage of cleared land, the amount of woodland also decreasing in going from the southern end of the County toward the north.

The forest survey made in 1909 showed that of the wooded area 76 per cent is hardwood forest, 17 per cent pine, and the remainder, 7 per cent, mixed pine and hardwood. In the mixed hardwood, 8,251 acres support stands of 5,000 board feet or over to the acre, and 39,489 acres of less than this; 40 acres contain stands of pine and cypress

in excess of 5,000 feet, and 10,482 of less; while 4,128 acres, all below 5,000 feet, are in mixed hardwood and pine. On the more or less steep sides of ravines and streams a slope type of woodland is found: consisting of chestnut, white and red oaks, and hickory—on the upper slopes; tulip poplar, gum, ash, elm, and willow—on the lower. The bottom type occurs along the creeks where there is little fall, being composed of ash, elm, sycamore, red maple, and red gum. A third, known as the old-field type, may be distinguished frequently on cleared fields that have been abandoned. These have usually grown up in pine, the predominating species being loblolly and scrub pines, except in the southern part of the County, where the growth is more often of scrub pine only.

USES OF THE FORESTS.

A variety of products is derived from the Calvert County forests annually, contributing a total revenue of over $200,000. The amount cut aggregates nearly one and one-half million cubic feet, which is a little greater than the estimated annual increment of all the forests in the County. The local forest products are in part the output of 20 mills which are in operation here, and for the rest they represent the cut of many individual timber operators and farmers, the latter of whom contribute heavily to what is taken from the forests, selling, however, only a part of it, and using the remainder on their farms. In point of value lumber ranks first, with railroad ties, piling, cordwood, mine props, poles, export logs, and shingles following in the order named.

Manufacturers of wood and dealers in lumber are not numerous in this County, and the local timber business is largely in the hands of the sawmill men and individual operators. These producers enjoy the immense advantage of easy accessibility to nearby markets, in that no portion of the County is farther than five miles from navigable water, while an improved highway passes directly through it from north to south. There is also some railroad transportation, though limited to but 10 miles which pass through east and west in the extreme northern part.

The forests of Calvert County have been culled repeatedly, and the few heavy stands that still exist are found chiefly in the central and south-central portions. Destructive lumbering has been carried on here for many years and most of the cutting that has been conducted throughout the County has been wasteful in method, and improvident where it concerned a future supply. Fortunately forest fires, prevalent and prejudicial to good forests in many sections of

the State, are seldom experienced here, so that with the new and superior stand of young growth now coming up there exists a chance for improvement in the County's woodland. Present cutting and annual growth are not far from equal. With judicious handling they may be kept so, at the same time that the cut is increased and new markets in this important trade developed.

CALVERT COUNTY.

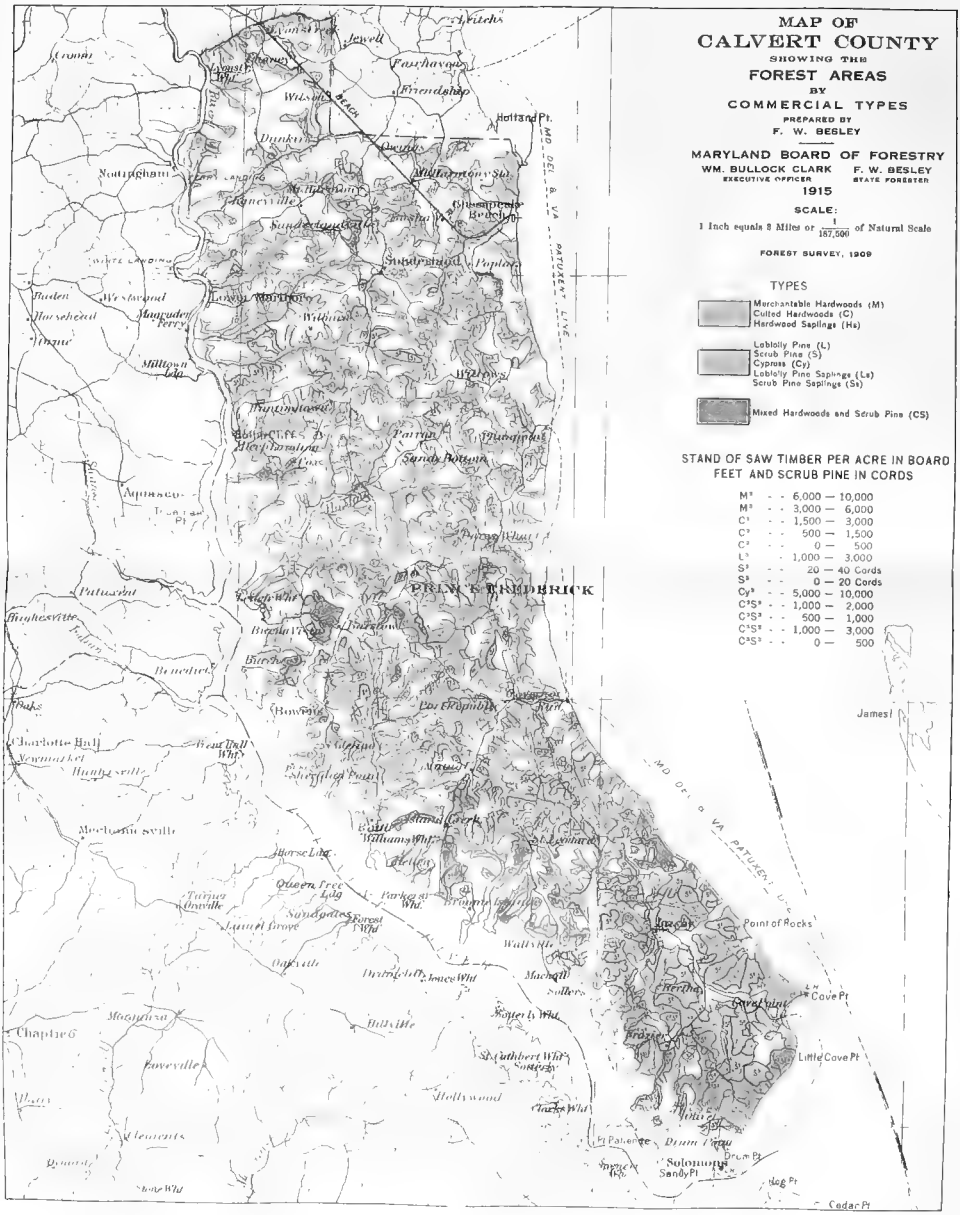
SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	4,020,000 Board Feet	$18.00 per M	$72,360
Softwood	1,005,000 Board Feet	15.00 per M	15,075
Pulpwood	1,650 Cords	6.00 per Cord	9,900
Railroad Ties	112,000	.50 each	56,000
Piling	215,000 Lineal Feet	.10 per Foot	21,500
Cordwood	2,750 Cords	3.00 per Cord	8,250
Mine Props	2,800 Tons	2.50 per Ton	7,000
Poles	1,800	2.75 each	4,950
Shingles	840,000	4.25 per M	3,570
Lath	10,000	3,25 per M	32
Posts	800	.15 each	120
Export Logs	128,000 Board Feet	30.00 per M	3,840
The County	1,448,475 Cubic Feet		$202,597

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $4.00 per M.	Total $
1	48,374	26,839	56	24,583	5,197	29,780	$98,332	$20,788	$119,120
2	42,496	16,931	40	28,818	1,461	30,279	115,272	5,844	121,116
3	48,462	18,620	39	17,485	1,094	18,579	69,942	4,374	74,316
The County	139,332	62,390	45	70,886	7,752	78,638	$283,546	$31,006	$314,552

Stone Mill
Cedar Pt


MAP OF
CALVERT COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1909
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Ha)
Loblolly Pine (L)
Scrub Pine (S)
Cypress (Cy)
Loblolly Pine Saplings (Ls)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET AND SCRUB PINE IN CORDS
M¹ - - 6,000 — 10,000
M² - - 3,000 — 6,000
C¹ - - 1,500 — 3,000
C² - - 500 — 1,500
C³ - - 0 — 500
L¹ - - 1,000 — 3,000
S¹ - - 20 — 40 Cords
S² - - 0 — 20 Cords
Cy¹ - - 5,000 — 10,000
C¹S¹ - - 1,000 — 2,000
C²S² - - 500 — 1,000
C¹S² - - 1,000 — 3,000
C²S³ - - 0 — 500
PRINCE FREDERICK
Point of Rocks
Cove Pt
Little Cove Pt
Solomons
Sandy Pt
Drum Pt
Cedar Pt
James I
MD DEL & VA PATUXENT LINE

CAROLINE COUNTY.

Caroline County lies well in the central part of the eastern shore peninsula. The land is comparatively flat, the average elevation varying only from about 10 feet along the Choptank River to 75 in the northern end of the county. The soils are for the most part sandy loam, with a large acreage suitable for farming, as well as much that is capable when rightly handled of producing excellent stands of merchantable pine.

The Forests.

At the present time forest lands are somewhat evenly distributed over the County, with the exception of the central part at Denton, Ridgely, and Goldsboro, where there has been extensive clearing of land in recent years. The total wooded area is now but 30 per cent. The northern third of the County lies in the hardwood belt, while in the remainder pure stands of pine predominate, with frequent areas of pine and hardwood forests in mixture. The hardwood forests are made up principally of several kinds of oak, red and black gum, tulip poplar, and hickory. The gums and maple, with willow and pin oaks, occur in the swamp lands, while the white and red oaks and hickory are found on well-drained soils. Although only two are abundant, several species of pine occur in the County. Of these, loblolly pine is easily the most valuable as well as common, the next in importance being scrub or spruce pine, which is found in the central part of the County and, to a limited extent, in the southern part as well.

The great progress which this County has made in agriculture within the last decade has had a marked influence upon forest distribution. The better soils have been, and are still being, rapidly cleared, and the local demand for timber has caused severe culling and a heavy drain upon the forest. In the mixed pine and hardwood stands, which form so large a part of the forest throughout the central and southern portions of the County, the pine has generally been taken. Less valuable hardwoods are left, and this process has naturally and very materially changed the composition of the forests, and brought about in them a marked deterioration. It is probable that when the new young stands of hardwood mature and are cut, that pine will very generally return, as it is a species which quickly reseeds openings where soil is suitable. Outside of the swampy areas where gum, maples and water oak predominate, the soil is usually well

adapted to pine. Stands of hardwood and of pine are very evenly matched so far as their extent is concerned, there being 34 per cent of each in the County's wooded area, while the remaining 32 per cent is comprised of a mixed stand of each. The forest survey of 1910 indicated that of the total area in woodland, 1,861 acres contain stands of hardwood in excess of 5,000 feet per acre, while the much greater total of 19,775 acres has stands of less than this; pine stands of 5,000 feet or more occupy 1,825 acres, with 19,206 acres or less; while 20,167 acres represent the area in mixed stands, all of which fall under 5,000 feet per acre.

USES OF THE FORESTS.

The timber cut of Caroline County for the past five years has, considering the County's size, been exceptionally large, but is now rapidly becoming less as the result of timber exhaustion which seems to be quite general. In 1914 the 61 sawmills, and probably many more individual operators among the landowners and farmers, produced a total of 1,546,000 cubic feet of wood, with a value at the mill or shipping point of $178,654. In this County as in the rest, lumber is the most important of its forest products, both in amount and value, it being followed by cordwood, piling, mine props, railroad ties, pulpwood, poles, lath, shingles, and fence posts. There was also a large amount of veneer included in the total lumber cut, there being a considerable demand for such material because of the number of local concerns using fruit and vegetable packages made up of cheap veneers. In fact, the falling off in the County's present timber cut is having a marked influence upon these separate industries, as the boxes, crates, baskets, and construction material which they require for canning, trucking, and building cannot be obtained elsewhere as advantageously as they may be at home. There are 7 retail yards and 4 planing mills which are well distributed over the County, they being located at Denton, Goldsboro, Greensboro, Preston, and Ridgely; at Greensboro and Ridgely are plants manufacturing crates and baskets, box factories at Denton, Federalsburg, and Preston. Wood-using industries are well represented in this County, as they should be in a section where timber production and timber growing are both of importance.

Transportation facilities are excellent for marketing forest products, and there is little of the County's timber which cannot be used because it is inaccessible. The Choptank River is navigable as far as Denton, the County seat, and 4 lines of railway traverse Caroline County for a total of 45 miles. No section is farther than 7 miles from a railroad, which, together with the considerable number of improved macadam roads extending in all directions, gives to the entire County excellent means of transportation.

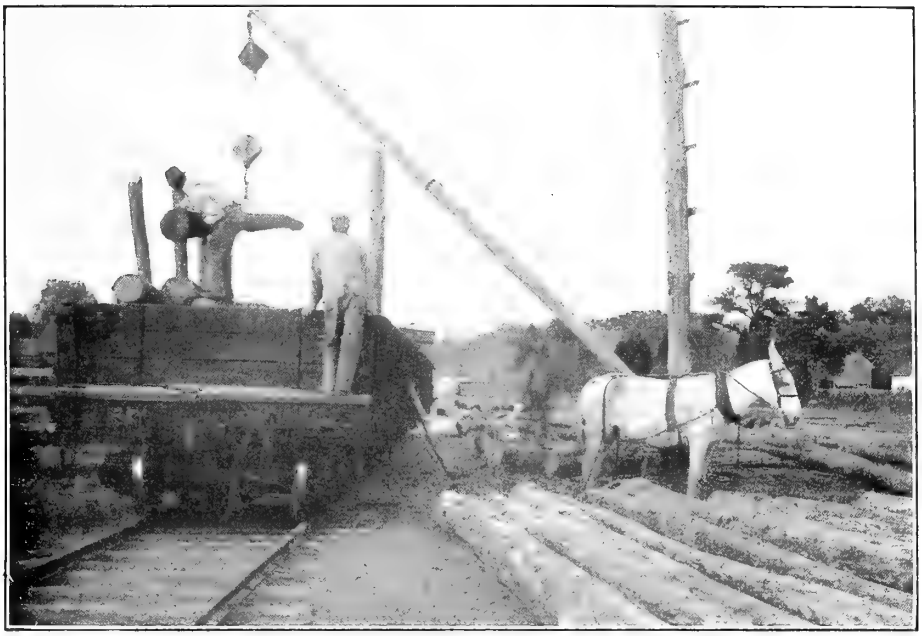


PLATE X. FIG. 1.—LOADING MINE PROPS.

As a source of props for outside use, the Eastern Shore, with its loblolly pine, at present takes high rank.

PLATE X. FIG. 2.—HIGH-GRADE MARYLAND POPLAR.

Large yellow poplar logs like these, with black walnut, are used whenever obtainable by local manufacturers of first-quality veneers; and considerable quantities of these woods, in the log, are normally demanded by the export trade.

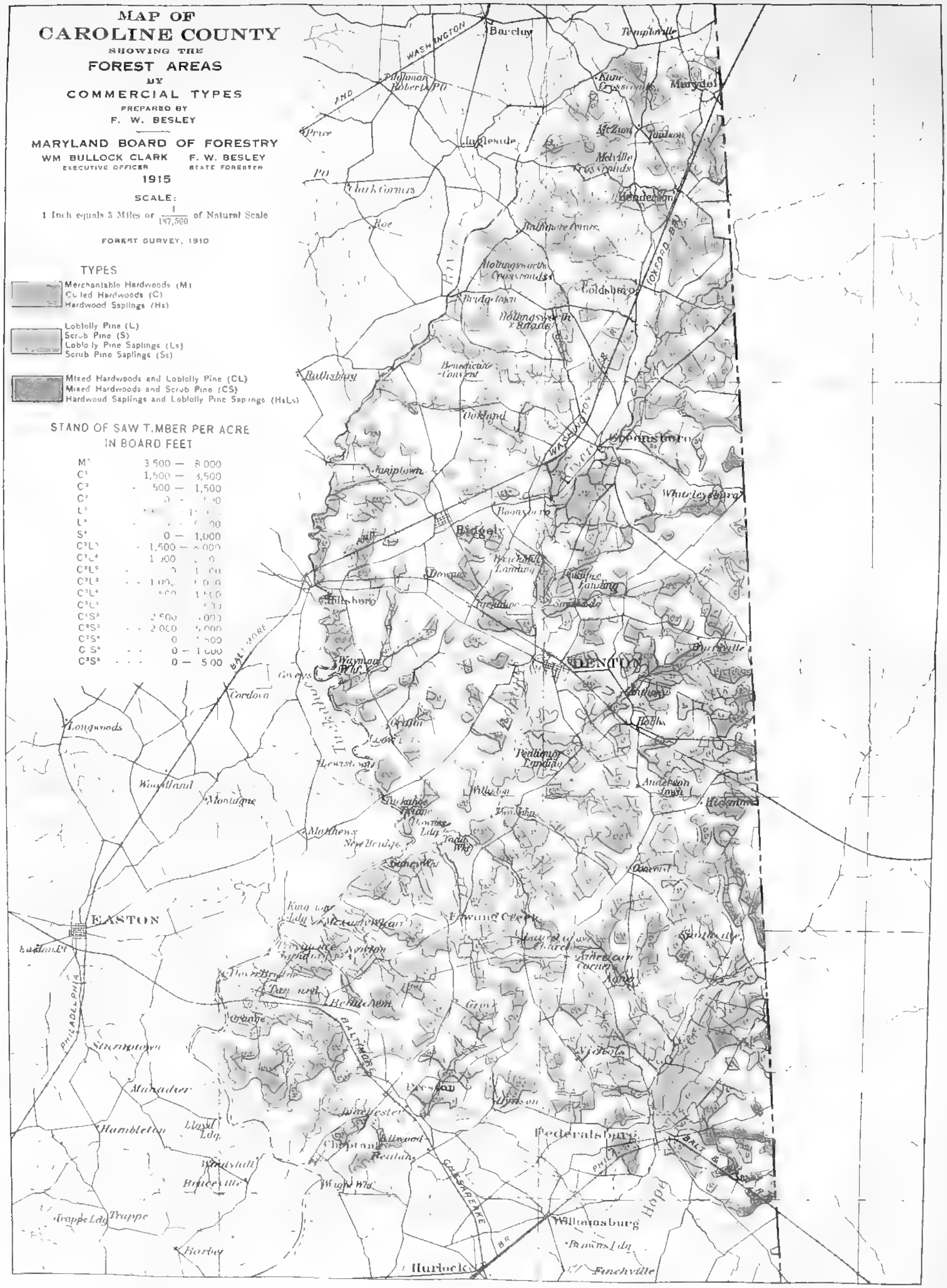
CAROLINE COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	4,300,000 Board Feet	$18.00 per M	$77,400
Softwood	3,150,000 Board Feet	15.00 per M	47,250
Pulpwood	450 Cords	5.50 per Cord	2,475
Railroad Ties	6,500	.60 each	3,900
Piling: Oak	20,000	.10 per Foot	2,000
Pine	100,000	.10 per Foot	10,000
Cordwood	7,800 Cords	3.00 per Cord	23,400
Mine Props	3,000 Tons	2.75 per Ton	8,250
Poles	1,200	2.00 each	2,400
Shingles	112,000	4.50 per M	504
Lath	200,000	3.50 per M	700
Posts	2,500	.15 each	375
The County	1,546,000 Cubic Feet		$178,654

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	22,840	6,138	27	3,504	2,320	5,824	$14,016	$11,600	$25,616
2	33,210	10,283	31	6,943	4,802	11,745	27,772	24,010	51,782
3	28,970	10,993	38	7,687	11,445	19,132	30,748	57,225	87,973
4	32,590	8,777	27	2,032	17,768	19,800	8,128	88,840	96,968
5	21,650	8,167	38	2,782	11,374	14,156	11,128	56,870	67,998
6	24,040	5,318	25	2,578	5,191	7,769	10,312	25,995	36,307
7	16,760	3,656	22	2,231	1,217	3,448	8,924	6,085	15,009
8	28,290	9,502	34	3,520	7,745	11,265	14,080	38,725	52,805
The County	208,350	62,834	30	31,277	61,862	93,139	$125,108	$309,350	$434,458



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FOREST SURVEY, 1910
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Scrub Pine (S)
Loblolly Pine Saplings (Ls)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Scrub Pine (CS)
Hardwood Saplings and Loblolly Pine Saplings (HsLs)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
C¹ 1,500 — 3,500
C² 500 — 1,500
S⁴ 0 — 1,000
C³S⁴ 0 — 500
Barclay
Templeville
Marydel
WASHINGTON
AND
Ingleside
Henderson
Goldsboro
Bridgetown
Benedictine Convent
Oakland
Greensboro
Whiteleysburg
Boonsboro
Ridgely
Downes
Hillsboro
Tuckahoe
DENTON
Burrsville
Hobbs
Cordova
Longwoods
Woodland
Montague
Matthews
New Bridge
EASTON
Easton Pt
PHILADELPHIA
BALTIMORE
Bethlehem
Preston
Federalsburg
Williamsburg
Hurlock
Finchville
Hambleton
Trappe
Barber

CARROLL COUNTY.

Carroll County lies in the Piedmont section of the northern central portion of the State. It is distinctly an agricultural County, since only 13 per cent of it is forest, and 76 per cent improved farm land in a high state of cultivation. The surface is somewhat broken by irregular valleys and rounded hills, with Parr's Ridge, the most prominent elevation, extending northeast and southwest through the central part of the County. Along this ridge, and to the east of it, occurs by far the larger portion of the County's woodlands.

The Forests.

Local woodlands consist for the greater part of woodlots owned by farmers, and confined to the lands not readily arable. The good soils of the county are reflected in the forest growth, which is exceptional, and marked by tall and well-proportioned trees. The forests are principally hardwood, with a few woodlots in the western part in which mixed hardwoods and pine occur. The principal commercial species are white and red oaks, tulip poplar, hickory, and chestnut. The latter is abundant on Parr's Ridge and the hills northeast of Westminster, though not of frequent occurrence in other portions of the county. It has been so severely attacked by the blight that it is not likely to possess much commercial importance in the future.

The forests of Carroll County are chiefly noteworthy for the very high percentage of hardwood timber which they contain. The forest survey of the County's woodlands, made in 1911, shows that 1 per cent only is in mixed pine and hardwood, the remaining 99 per cent being pure hardwoods in either culled or merchantable stands. Of this, 3,513 acres have stands of hardwood amounting to 5,000 feet or more per acre, with 35,401 acres of hardwood amounting to less than this; only 359 acres are in hardwood and pine, and all of this in stands of less than 5,000 feet.

Uses of the Forests.

Forest products obtained annually from this limited area of woodland amount in value to $118,800, in volume to 991,960 cubic feet. This represents the cut of 25 mill and timber operators, nearly all of

the former employing portable mills. Lumber ranks first in order of production and value, with railroad ties second, and cordwood third. Then follow, in order of relative importance, poles, shingles, pulpwood, tanbark, posts and export logs. These forest products are made readily accessible by 55 miles of railway lines in the County, and 17 additional along its southern border. There are also numerous improved highways which give access to all parts of the County and furnish cheap means of transportation for the hauling and marketing of forest products. There are 17 retail yards, located at Hampstead, Keymar, Linwood, Mt. Airy, New Windsor, Sykesville, Taneytown, Union Bridge, and Westminster, while the manufacturing part of the business is represented by only a planing mill at Mt. Airy, saw and shingle mills at Woodbine, some cooperage work and wagon building at Westminster.

In general the stand of timber per acre is good, due to the rich soil and protection from forest fires, in which respect Carroll ranks fifth among the counties. The timber values are correspondingly high, and there exists a stable local demand. Since the woodlots are more or less isolated, and protected by the owners, fires are infrequent, and the present tendency is toward the production of good timber. In an agricultural sense Carroll County is highly developed, and proper management of its wooded area cannot help but contribute substantially to its general prosperity along these lines.

The forest products of this County will of course never be of paramount importance because of the restricted area devoted to forest culture, but the per acre production should be high because of good soil and the intensive methods which generally prevail. The native tree species which are reproduced are of high commercial value, the fire danger is well under control, and the farmer with his relatively small woodlot is in a position to give careful attention to it. The present annual cut of 991,960 cubic feet on the 39,292 acres in forest represents very nearly the annual increment, and this cut may be maintained under present methods. Improved means of handling the forests—complete fire protection, better systems of cutting to favor the young growth, elimination of unprofitable trees, and restricted grazing of the woodlands—would in a few years increase present production 60 per cent. There is generally a good local demand for wood and timber, favoring close utilization and a profitable forest management.

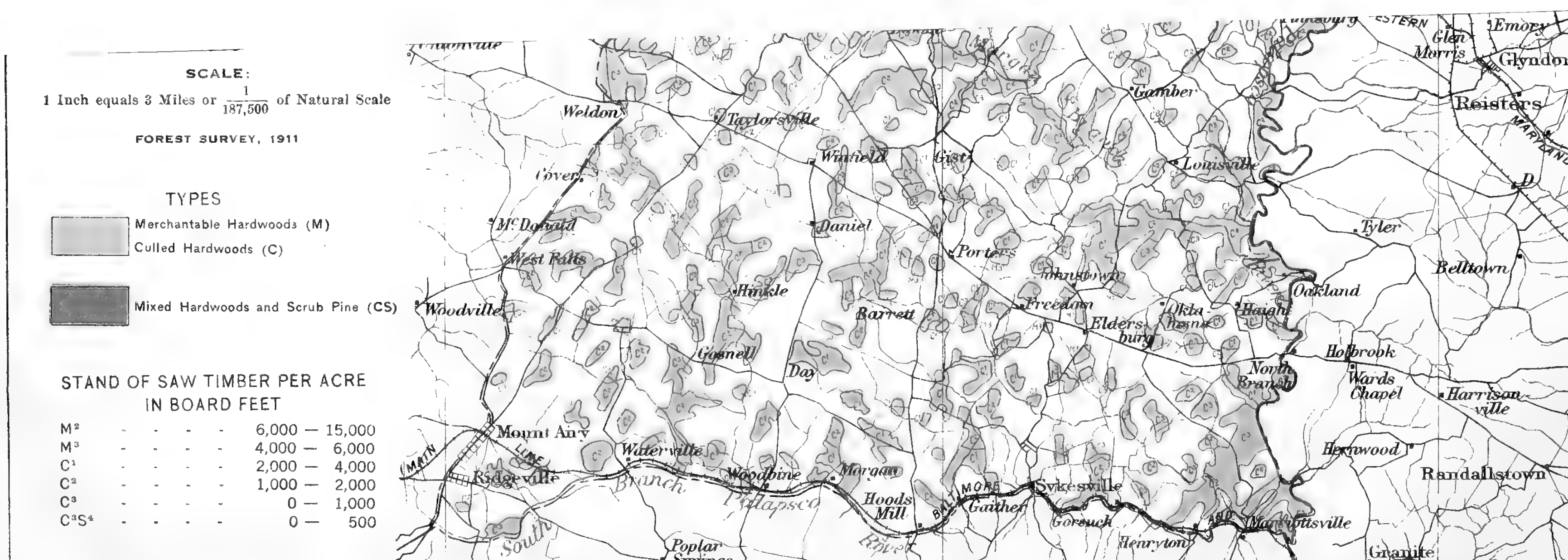
CARROLL COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Mixed Oak	2,490,000 Board Feet	$18.00 per M	$44,820
Chestnut	1,410,000 Board Feet	15.00 per M	21,150
Pulpwood	300 Cords	6.50 per Cord	1,950
Railroad Ties:			
White Oak	19,000	.65 each	12,350
Mixed Oak	19,000	.45 each	8,500
Chestnut	19,000	.20 each	3,800
Cordwood	4,500	3.50 per Cord	15,750
Tan Bark	180 Tons	8.50 per Ton	1,530
Poles: Chestnut	1,800	3.00 each	5,400
Shingles	500,000	4.50 per M	2,250
Posts	3,500	.20 each	700
Export Logs	20,000 Board Feet	30.00 per M	600
The County	991,960 Cubic Feet		$118,800

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $
1	25,975	1,518	6	4,732	160	4,892	$23,660	$800	$31,660
2	21,136	1,455	7	5,144	.....	5,144	25,720	.....	25,720
3	25,735	3,301	13	9,855	.....	9,855	49,275	.....	49,275
4	57,804	10,779	19	21,426	.....	21,426	107,130	.....	107,130
5	17,797	3,311	19	6,398	.....	6,398	31,990	.....	31,990
6	34,524	6,420	19	12,008	.....	12,008	60,040	.....	60,040
7	30,082	2,998	10	6,983	.....	6,983	34,915	.....	34,915
8	20,229	2,980	15	7,110	.....	7,110	35,550	.....	35,550
9	18,081	3,199	18	4,608	.....	4,608	23,040	.....	23,040
10	13,797	869	6	2,407	19	2,426	12,035	95	12,130
11	15,907	693	4	1,914	.....	1,914	9,570	.....	9,570
12	4,725	188	4	687	.....	687	3,435	.....	3,435
13	10,237	1,581	15	2,105	.....	2,105	10,525	.....	10,525
The County	296,029	39,292	13	85,377	179	85,556	$426,885	$895	$427,780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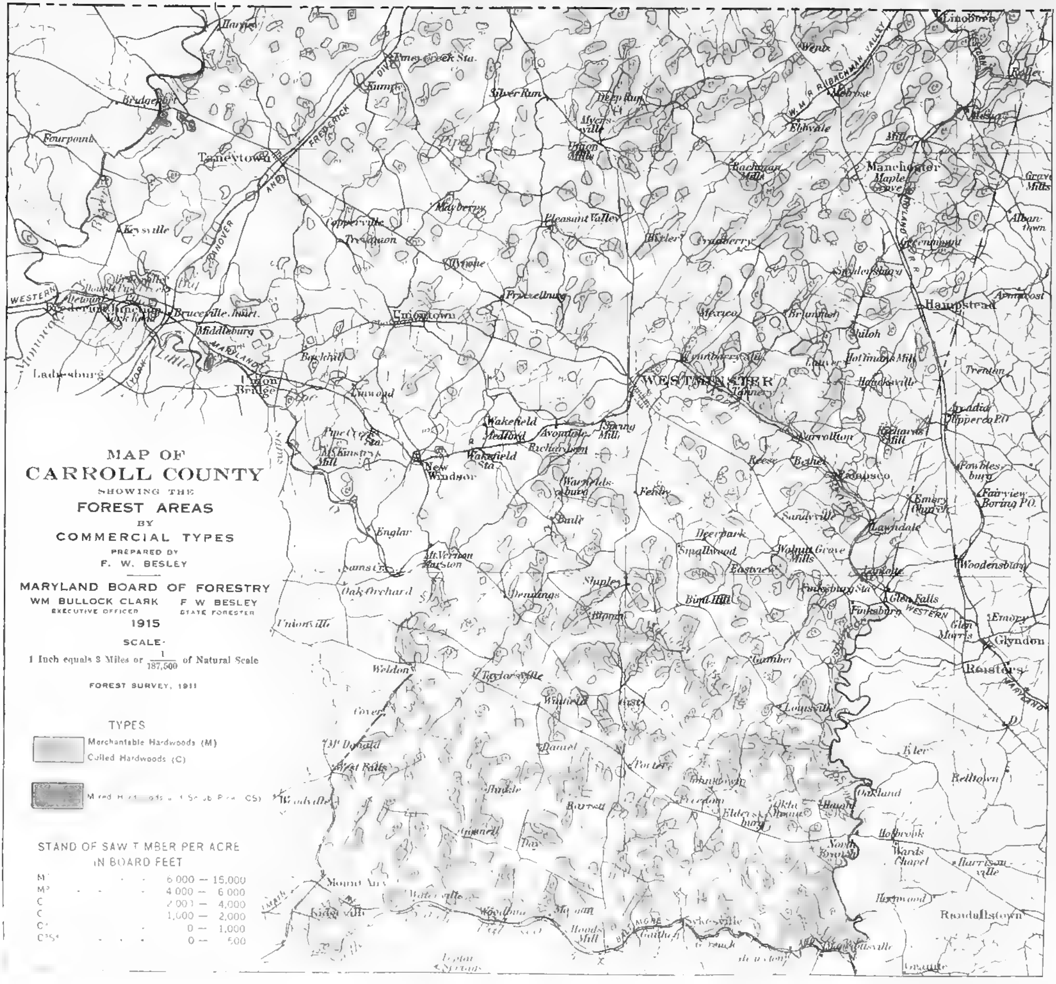
FOREST SURVEY, 1911
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M² - - - - 6,000 — 15,000
M³ - - - - 4,000 — 6,000
C¹ - - - - 2,000 — 4,000
C² - - - - 1,000 — 2,000
C³ - - - - 0 — 1,000
C³S⁴ - - - - 0 — 500
Weldon
Taylorsville
Winfield
Gist
Gamber
Glen Morris
Emory
Glyndon
Reisters
Louisville
McDonald
West Falls
Daniel
Porters
Tyler
Belltown
Woodville
Hinkle
Barrett
Freedom
Eldersburg
Oakland
Holbrook
Wards Chapel
Harrisonville
Gosnell
Day
North Branch
Mount Airy
Waterville
Ridgeville
Woodbine
Morgan
Hoods Mill
Gaither
Sykesville
Gorsuch
Henryton
Marriottsville
Hernwood
Randallstown
Granite
Poplar Springs
Patapsco
South Branch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IN BOARD FEET
6,000 — 15,000
4,000 — 6,000
2,000 — 4,000
1,000 — 2,000
0 — 1,000
0 — 500
Taneytown
Fourpoint
Bridgeport
Keysville
Ladiesburg
Union Bridge
Uniontown
Middleburg
Bruceville
Linwood
New Windsor
Wakefield
Medford
Avondale
Frizzellburg
Pleasant Valley
Silver Run
Union Mills
Mayberry
Copperville
Tyrone
Westminster
Manchester
Maple Grove
Hampstead
Melrose
Lineboro
Shiloh
Mexico
Greenmount
Snydersburg
Arcadia
Upperco P.O.
Fowblesburg
Fairview
Boring P.O.
Patapsco
Lawndale
Woodensburg
Finksburg
Glen Falls
Glyndon
Reisterstown
Emory
Englar
Mt. Vernon
Marston
Oak Orchard
Unionville
Weldon
Taylorsville
Winfield
Gamber
Louisville
Woodville
Mt. Airy
Ridgeville
Woodbine
Eldersburg
Sykesville
Hoods Mill
Oakland
Holbrook
Wards Chapel
Harrisonville
Randallstown
Belltown
Trenton
Deer Park
Smallwood
Sandyville
Carrollton
Bachman Mills
Deep Run
Myers ville
Emory Church
Walnut Grove Mills
Westminster
WESTERN
MARYLAND
FREDERICK
HANOVER

CECIL COUNTY.

Cecil County is located at the northeast corner of Maryland. Bounded on the east side by Delaware and on the north by Pennsylvania, it is at the beginning of Chesapeake Bay, from which tidewater streams cut deeply into the County from two sides. The Susquehanna River is the dividing line between this County and Harford, on the western side, while the main line of the Pennsylvania Railroad divides it into two distinct areas—on the southeast the Coastal Plain, and on the northern side the Piedmont Plateau. Low hills and broad valleys characterize the topography of much of Cecil County, these elevations rising to Black Hill, at a height of 311 feet, in the corner of the County known as Elk Neck. Local soils vary much, from those which are barren to others exceedingly rich. The poorer situations are in the northwestern part, sassafras loam in the northeast, and in the southern section both sand and loam. There is much good farm land in the latter, as also in the northern central part. In the northwest are the more rocky soil formations, with many fair-sized patches of forest.

The Forests.

Forests distinctly characteristic of the Coastal Plain and Piedmont divisions meet in this county, of which 24 per cent is wooded. Although there is no portion of the county where there is not a fair amount of forest, it is in the central part, from Perryville to Leslie, and south from Leslie along Elk Neck, that the largest bodies of woodland occur. The area north of Perryville represents in large part the holdings, at one time or another, of the present Whitaker Iron Company, originally the old Principio Furnace. As such it has been cut over and "charcoaled" repeatedly, which, together with the now prevalent chestnut blight and the logging operations necessitated by the utilization of affected timber, has had an important bearing upon the present wooded area. In 1722 the Principio Furnace was first placed in operation. During the Revolutionary period it furnished munitions to the armies of Washington, and from Colonial days to the present it has been in continuous operation, though the output within recent years has become relatively small.

The forests in the upper part of the County are principally in woodlots, and in the southern half are confined in large part to the shores of the Bay and along the numerous tidewater streams. Where the Piedmont section occurs, the most important trees are the white and black oaks, chestnut, hickory and poplar; in the Coastal Plain there are Spanish, willow, pin and swamp white oaks, as well as gum. In the east-central part of the County there are scattered clusters of scrub pine, but no real softwood forests. A forest survey made in 1911 showed Cecil County's woodlands to be exceptional, in that they ranked as 100 per cent hardwood—21,738 acres containing timber amounting to 5,000 board feet and upward per acre, and 50,805 acres of less.

USES OF THE FOREST.

There are 24 portable and stationary mills, principally the former, in operation, and their cut in 1914 aggregated 716,780 cubic feet of wood, worth $96,893. Lumber came first, then poles, cordwood, piling, charcoal, pulpwood, railroad ties, shingles, posts and lath. Practically all of the pole material was chestnut, which since the introduction of the blight has been cut and marketed in constantly increasing quantities, and often at unreasonably low prices, in order to make some utilization of the affected trees. It is easy and quite profitable to market railroad ties here, for there are 62 miles of railway in the County, a consequently favorable market, and easy accessibility to wooded regions. At Colora, Conowingo, Elkton, Georgetown, Leslie, North East, Port Deposit, and Rising Sun there are retail lumber yards. There are also planing mills at Elkton and Port Deposit, a boat yard at Chesapeake City, and one for barges at Elkton. In view of superior facilities for water transportation, it seems that there might be additional opportunities for the development and enlargement of this branch of the wood-using industry.

In the past, forest fires have been prevalent in this County, much to the detriment of existing woodlands. Local forests have suffered much in this respect, as also later from the blight, and frequently from wasteful cutting. In the better agricultural districts clearing for farming is going on, and much of the older farm lands are growing up in trees of inferior species. From these causes and others the forests of Cecil County may hardly be said to be in the most desirable or productive condition; prompt and efficient measures are needed for their improvement.

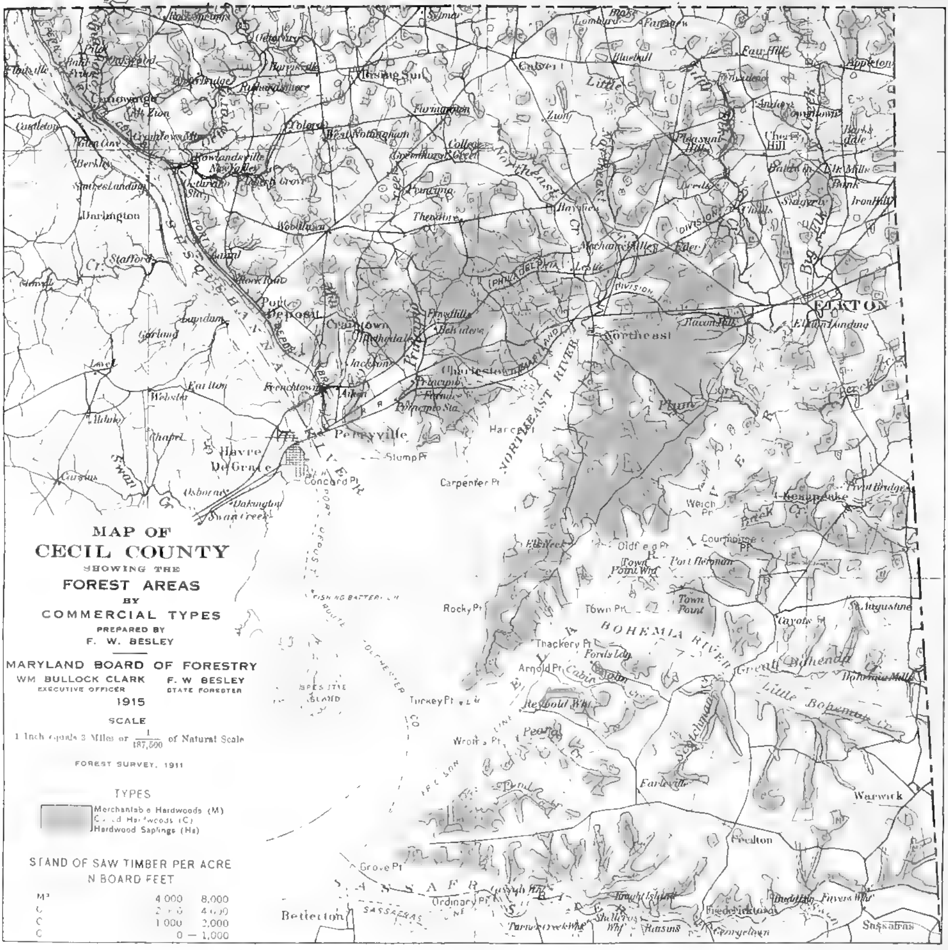
CECIL COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	2,972,000 Board Feet	$17.50 per M	$52,010
Softwood	100,000 Board Feet	14.00 per M	1,400
Pulpwood	600 Cords	5.50 per Cord	3,300
Railroad Ties	4,500	.55 each	2,475
Piling	40,000 Lineal Feet	.10 per Foot	4,000
Cordwood	3,200	3.50 per Cord	11,200
Poles	7,000	2.50 each	17,500
Shingles	200,000	4.50 per M	900
Lath	45,000	3.50 per M	158
Posts	3,000	.15 each	450
Charcoal	35,000 Bushels	.10 per Bushel	3,500
The County	716,780 Cubic Feet		$96,893

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $4.50 per M.	Total $
1	42,361	5,812	13	12,799	.....	12,799	$51,196	.....	$51,196
2	29,154	8,004	27	18,917	.....	18,917	75,668	.....	75,668
3	25,675	4,167	16	11,549	.....	11,549	46,196	.....	46,196
4	18,102	2,739	14	8,617	.....	8,617	34,468	.....	34,468
5	45,132	17,676	38	15,532	.....	15,532	62,128	.....	62,128
6	19,765	2,992	15	6,271	.....	6,271	25,084	.....	25,084
7	17,086	5,700	33	7,617	.....	7,617	30,468	.....	30,468
8	10,775	4,692	45	4,960	.....	4,960	19,840	.....	19,840
9	15,147	1,761	12	3,070	.....	3,070	12,280	.....	12,280
The County	223,197	53,543	24	89,332	.....	89,332	$357,328	.....	$357,328


MAP OF
CECIL COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
EXECUTIVE OFFICER
F. W BESLEY
STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1911
TYPES
Merchantable Hardwoods (M)
Hardwood Saplings (Hs)
STAND OF SAW TIMBER PER ACRE
N BOARD FEET
4,000 8,000
1,000 2,000
0 — 1,000
ELKTON
Northeast
Charlestown
Perryville
Havre DeGrace
Port Deposit
Rising Sun
Conowingo
Frenchtown
Principio Furnace
Calvert
Fair Hill
Appleton
Elk Mills
Chesapeake City
Warwick
Earleville
Cecilton
Fredericktown
Georgetown
Betterton
Sassafras
Concord Pt
Carpenter Pt
Turkey Pt
Grove Pt
Ordinary Pt
Rocky Pt
Town Pt
Arnold Pt
Thackery Pt
Stump Pt
NORTHEAST RIVER
BOHEMIA RIVER
Little Bohemia Cr.
Darlington
Stafford
Webster
Swan Creek
Oakington
Osborne

CHARLES COUNTY.

Charles is distinctively a "southern Maryland" County, low-lying, along tidewater for the most part, and well in the Coastal Plain Division. On the west and south it is bordered by the Potomac, while on the eastern side the Patuxent River touches it for several miles. Prince George's County is on the northern side, with Calvert on the east. Light soils—from pure sand to sandy loam—predominate, and along the swampy sections there is a large amount of clay. A great part of this County was once intensively farmed, but changed economic conditions have brought about a reversion to forest of much that was once cleared for agriculture.

The Forests.

Excepting the mountain counties of Garrett and Allegany, Charles County possesses the largest percentage of forested land in Maryland, 59 per cent of its total area being in woodland. Unlike the forests of those sections, the tree growth here is not, in great part, on land that has never been cleared, but represents instead once cleared lands that since have been abandoned and naturally reforested. Pine has come up on much of this land, and it is usually possible in the young stands to still trace the lines of the old corn-rows. Fine young stands, both of hardwood and scrub pine, are abundant, but there is little timber of saw-log size near the railroads, where close cutting has been practiced for many years.

Great differences of elevation, with their corresponding change of type, do not exist in Charles County, but there are increasing stands of scrub pine, and the usual culled and merchantable hardwoods. There is a distinct swamp type of hardwood growth, with pin, willow, and swamp white oak, beech, river birch, black gum, red maple, red gum, and tulip poplar. In other sections the forests of hardwood partake of two different types, an upland and a lowland type. In the former are black, scarlet, and Spanish oaks, chestnut, hickory and scrub pine; in the latter white and red oaks, tulip, black gum and red gum. The forests of this county consist of 43 per cent hardwoods, 11 per cent pine, and 46 per cent mixed stands. On 6,868 acres of hardwood forest, according to the survey of 1912, there are stands of 5,000 feet or more per acre, and on 66,037 acres there are hardwood stands

of less than this; pine stands of 5,000 feet upward occupy 5,243 acres, less than this, 13,609 acres; while mixed stands of pine and hardwood are all below 5,000 feet, and occur on 79,790 acres of land.

USES OF THE FOREST.

The past ten years have brought a new forest industry to Charles County in the sale of scrub pine for pulpwood. Previous to this, the stands of pine were justly considered to be of small value, but now Charles is the one county in the State to have the amount and value of some other forest product exceed that of lumber. In 1914, 30 sawmills and the many more individual timber operators produced a total cut of 5,838,080 cubic feet, with a value of $484,866. Of this, $318,000 represented the pulpwood cut, with lumber next, then railroad ties, for which there exists a considerable demand, piling, mine props, poles, cordwood, shingles, veneer woods, charcoal, posts and lath. Small portable mills are chiefly responsible for the lumber cut, many operating as such in the winter, and being used in summer for threshing. The timber industry locally is closely confined to the producers, with no manufacturing worthy of comment. There are 30 miles of railway lines in Charles County, but aside from the stands of timber closely adjoining these lines it is difficult to make very long hauls at a profit. Traffic over the ordinary country road in winter is apt to be difficult, but of late several State highways have been completed which make parts of the county not on a railroad much more accessible. In addition, the Patuxent is navigable far above Benedict, in Charles County, while on the Potomac there are several steamboat lines which touch at local landings.

The future of forestry in the county is uncertain. The large bodies of arable land which reverted to forest as a result of economic conditions following the Civil War are still in forest. There is, however, the strong feeling that much of this land will in time be again cleared for agricultural crops. Such unstable conditions seriously interfere with systematic forest management; most of the owners are inclined to cut all merchantable material regardless of the future, and in consequence there is a very large percentage of severely culled forests of low production.

A decided change in policy is needed to secure the best results. It should be the object of the woodland owner to handle his property for successful timber crops by leaving after each cutting a sufficient amount of young growing stock to insure another cut in fifteen or twenty years, except in the case of pine stands, where clear cutting is usually best.

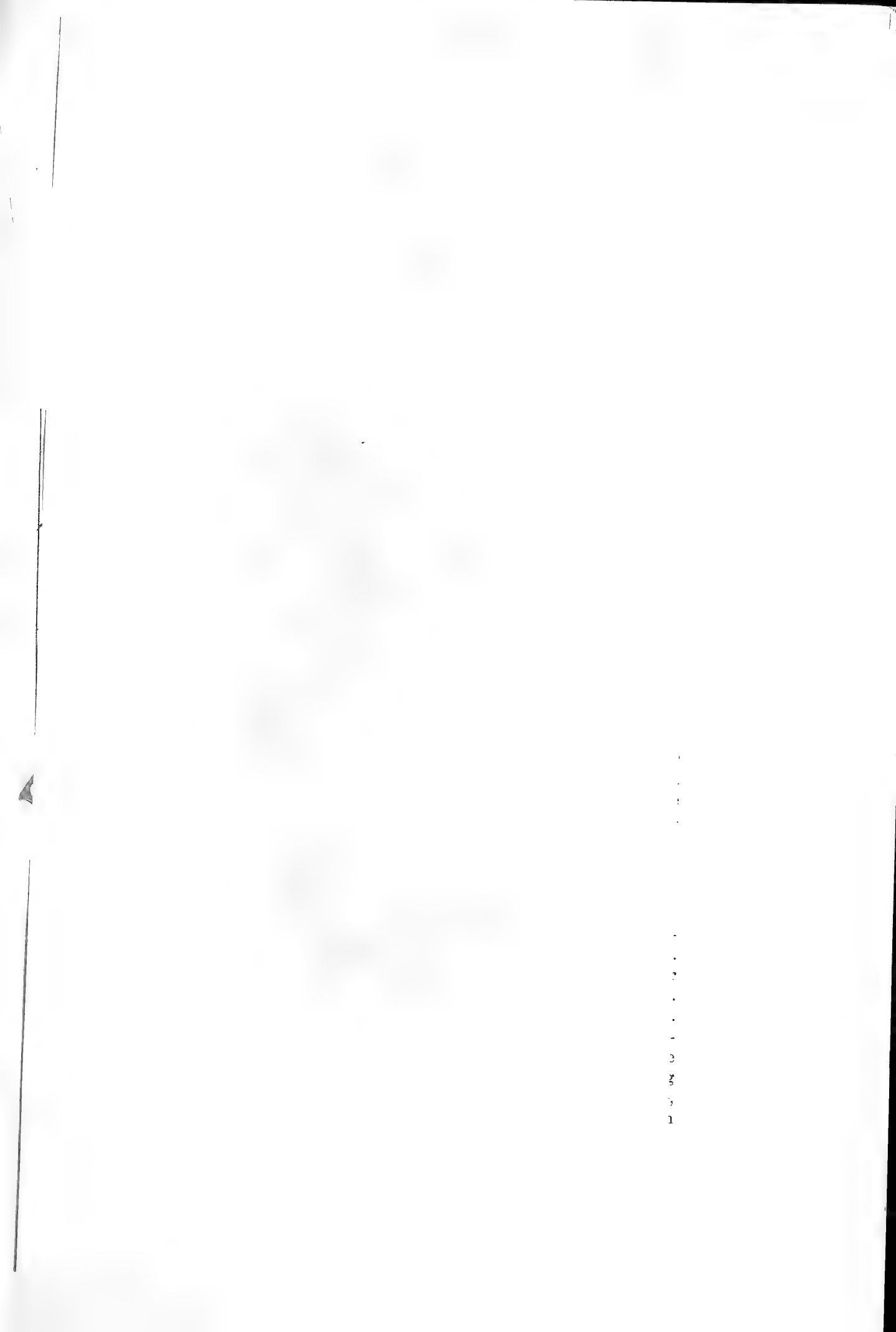
CHARLES COUNTY.

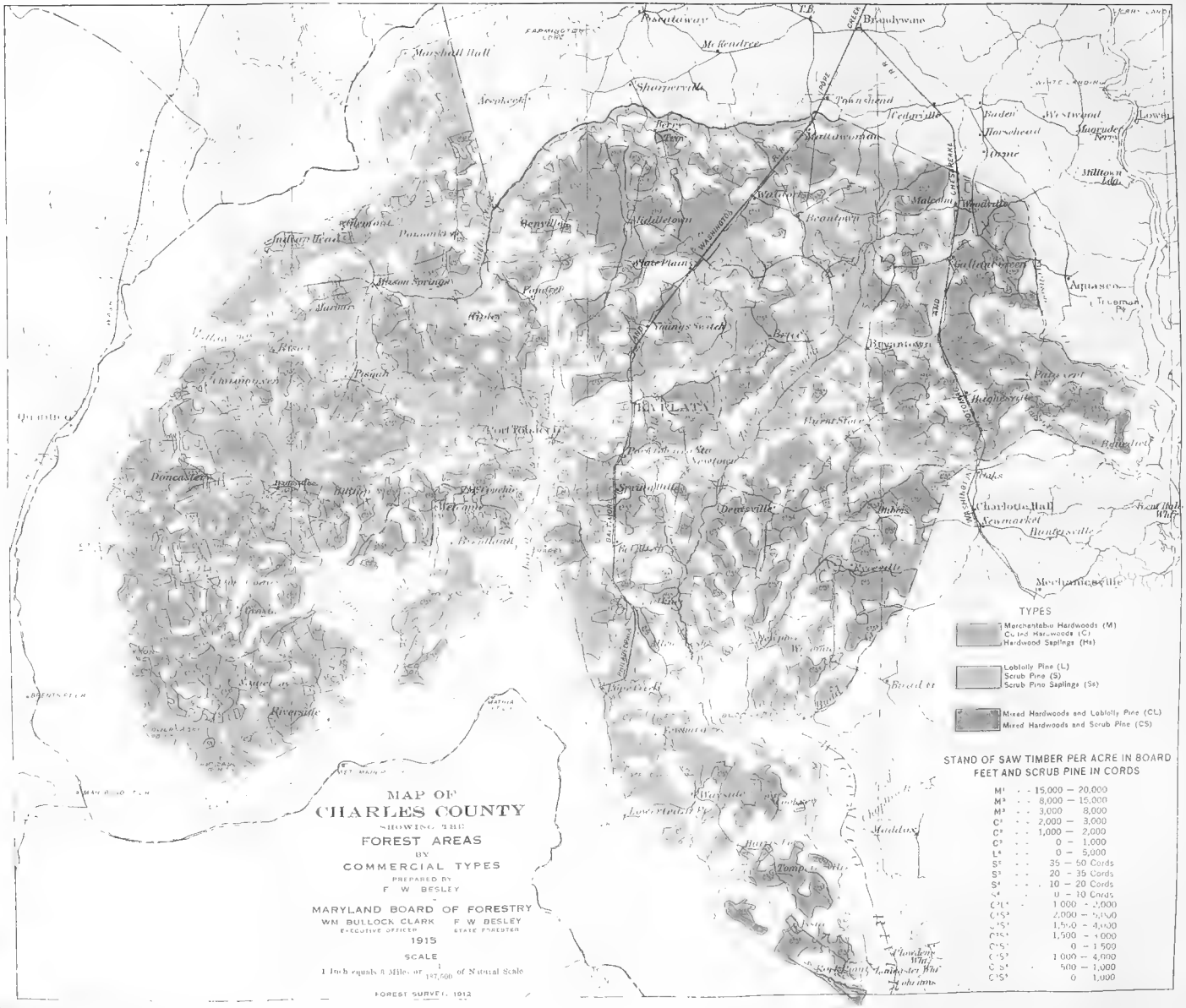
SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	3,557,500 Board Feet	$16.00 per M	$56,920
Softwood	1,770,000 Board Feet	14.00 per M	24,780
Pulpwood	53,000 Cords	6.00 per Cord	318,000
Railroad Ties	106,000	.55 each	58,300
Piling	100,000 Lineal Feet	.10 per Foot	10,000
Cordwood	1,200 Cords	3.00 per Cord	3,600
Mine Props	2,000 Tons	2.75 per Ton	5,500
Poles	2,000	2.50 each	5,000
Shingles	322,000	4.25 per M	1,368
Lath	30,000	3.25 per M	98
Posts	1,500	.20 each	300
Charcoal	10,000 Bushels	.10 per Bushel	1,000
The County	5,838,080 Cubic Feet		$484,866

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $4.00 per M.	Total $
1	26,421	13,569	51	14,501	5,720	20,221	$58,004	$22,880	$80,884
2	36,011	22,430	62	16,008	27,006	43,014	64,032	108,024	172,056
3	40,880	31,839	78	13,748	23,457	37,205	54,992	93,828	148,820
4	39,411	19,802	50	21,868	5,713	27,581	87,472	22,852	110,324
5	23,986	9,123	38	9,397	1,163	10,560	37,588	4,652	42,240
6	37,555	22,679	60	17,912	9,655	27,567	71,648	38,620	110,268
7	22,959	14,036	61	26,755	9,748	36,503	107,020	38,992	146,012
8	44,816	26,571	59	37,807	5,330	43,137	151,228	21,320	172,548
9	18,507	11,498	62	5,993	489	6,482	23,972	1,956	25,928
The County	290,546	171,547	59	163,989	88,281	252,270	$655,956	$353,124	$1,009,080




MAP OF
CHARLES COUNTY
SHOWING THE
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BY
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PREPARED BY
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1915
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1 Inch equals 3 Miles, or 1/190,080 of Natural Scale
FOREST SURVEY, 1912
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Ha)
Loblolly Pine (L)
Scrub Pine (S)
Scrub Pine Saplings (Sa)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET AND SCRUB PINE IN CORDS
M1 - - 15,000 — 20,000
M2 - - 8,000 — 15,000
M3 - - 3,000 — 8,000
C1 - - 2,000 — 3,000
C2 - - 1,000 — 2,000
C3 - - 0 — 1,000
L4 - - 0 — 5,000
S5 - - 35 — 50 Cords
S3 - - 20 — 35 Cords
S4 - - - 10 — 20 Cords
S4 - - 0 — 10 Cords
CL1 - 1,000 — 3,000
CL2 2,000 — 5,000
CL3 1,500 — 4,000
CL4 1,500 — 3,000
CL5 0 — 1,500
CS2 1,000 — 4,000
CS4 500 — 1,000
CS5 0 — 1,000

DORCHESTER COUNTY.

Dorchester, the third largest county in the State, lies on the eastern side of Chesapeake Bay between the Nanticoke and Choptank Rivers. The highest elevations in the county are not over 50 feet, with at least a half of the area below 10 feet in elevation, a fact which explains an area of marsh land which is larger than that of any other county in the State. There are few striking features of topography, and the soils of the higher elevations, notably in the northeastern section, consist principally of the Sassafras loam, one of the best agricultural formations on the eastern shore peninsula.

The marshes of the county are of two kinds, depending upon their elevation, the fresh water marshes, and the salt marshes. The former are mainly in tree growth and constitute a considerable portion of the forested area, while the latter, comprising 21 per cent of the entire land area, are devoid of tree growth or any vegetation except coarse grasses common to this type. The present area in salt marshes is still increasing, and as the salt water extends inland, the adjoining forests are gradually exterminated. In the southern section of the County where a large percentage of the salt marsh occurs, the pine trees on the margins of the swamps often have a sickly yellow foliage, and their rate of growth is extremely slow. A little farther in the swamp will be found the dead stems and stumps of trees that have been overcome by the salt. Loblolly pine is usually the last to succumb to this influence, but in the end is killed with the rest.

The Forests.

The forest area of Dorchester County, with the exception of Worcester, is greater than that of any other County on the eastern shore. The forests, which comprise 37 per cent of the county's area, occur generally in large, continuous areas like those of western Maryland. A mixed growth of hardwood and pine is the predominating type. Though there is a small amount of scrub pine in the northeastern section of the County, loblolly probably constitutes 95 per cent of the entire stand of pine, while mixtures of pine and hardwood occurring on the lower ground are made up principally of loblolly, red maple, red gum, black gum, willow and pin oaks. The oaks do not attain

their best development except on the better-drained soils, where they are able to maintain a deep root system. In the northern section of the County the forests are being steadily cleared away, while in the southern section much more land is growing up in forest than is being cleared. On the whole, the ratio of forest to cleared land is being maintained, and away from the agricultural sections—Cambridge, East New Market and Hurlock—few changes are taking place.

Loblolly pine, by far the most important of the County's timber species, is well distributed over the entire area, with a greater proportion occurring on the higher places. In swamps the principal species are red gum and the oaks, though everywhere the absence of fires has greatly aided reproduction of pine. Red gum, occurring principally on wet lands, attains large size, and has an extensive local use for basket and barrel veneers. In the southern section of the County, where there is a general lack of adequate transportation facilities, there has been less culling of the forest, but where the cutting is extreme several of the most important trees, notably red gum, are unable to retain their place in the forest by natural reproduction. There is some oak in the county, Spanish oak and willow oaks predominating, but the oaks are nowhere increasing, chiefly because of their poor reproduction on the wet land of the county.

The forests of Dorchester County are 14 per cent hardwood, 35 per cent pine, and 51 per cent mixed hardwood and pine. In the survey of 1910 it developed that of the hardwood forests, 2,458 acres contain stands of 5,000 feet or more per acre, with 16,395 acres of less; 8,182 acres of pine contain 5,000 or more feet to the acre, and there are 40,582 where the stumpage is less; while there are 27,115 acres of mixed stands of 5,000, and 43,559 of less than 5,000.

USES OF THE FOREST.

In general, methods of cutting have been those usually employed where timber is cheap and transportation expensive. Since there is a very large percentage of the swamp type of forest, logging operations are often difficult, and in such locations confined to the dryer seasons of the year, usually during the months from September to January. Though only the better grades are removed in less accessible regions, the pine as a rule is cut closer than hardwood. In spite of this, and due to its greater seeding capacity, it is appearing on cut-over lands wherever there are openings, even securing a foothold in hardwood swamps where hummocks occur.

On the swamp lands where pine is mixed with hardwood, all of the pine of mine-prop or saw-log size is cut, but only the best of the hard-

PLATE XI. FIG. 1.—THE FRESH-WATER SWAMP.

Areas like this (Zekiah Swamp, Charles County), while typical of similar inundated lands elsewhere about the State, frequently contain splendid forests of white oak, poplar, and red gum which have been saved through their comparative inaccessibility.

PLATE XI. FIG. 2.—THE SALT MARSH.

There are extensive areas of salt marsh on the Eastern Shore. The loblolly pine is the last tree to succumb in such situations, but, as in this case, it too has finally to retire from these unnatural conditions.

wood can be removed, largely because of its greater weight and the attendant difficulty of handling. Here the timber is "snaked" out to land which is dry enough for the use of high-wheel carts, the logs then being slung under the wheels and transported to the sawmills, or, in the case of mine props, to the railroads. Clear cutting is sometimes practiced in pine stands, but the usual method is to cut to a diameter of 6 or 8 inches on the stump. There is little demand for cordwood except near the towns and watercourses, and there is consequently much debris usually found on the ground after logging.

There are 37 mills in Dorchester County which, together with the timber men and farmers who work in the woods for part of the year at least, produced a cut of lumber in 1914 amounting to 2,231,160 cubic feet, and valued at $352,405. Lumber, especially pine, was by far the most important of the forest products, with cordwood second, then piling, lath, poles, railroad ties, mine-props, posts and shingles. There are 43 miles of railroad in the County which aid in marketing the forest crop, and also furnish a limited market for cross-ties. The roads in the County are reasonably good, and a fair share of its area accessible by the water route. There is a retail yard at Aireys, one at Hurlock, and two at Cambridge; also, at the latter place, a boat yard, with planing mills at Cambridge, East New Market, Hurlock, and Williston; and factories for boxes or crates at Cambridge, Hurlock, East New Market, Rhodesdale and Williamsburg.

Good forest management presents several problems in this County. Since the loblolly pine is the most valuable species and well adapted to nearly all of the County's soils, it is the first tree to be encouraged in reproduction. The next in importance as being particularly adapted to moist soils is red gum, and there are relatively few areas in this entire county that are sufficiently suitable for oak. The question of management is here largely one of favoring red gum in the poorly drained situations, and loblolly elsewhere. Both are trees of considerable value and good growth, and their encouragement cannot but result well for the timber owners of the County.

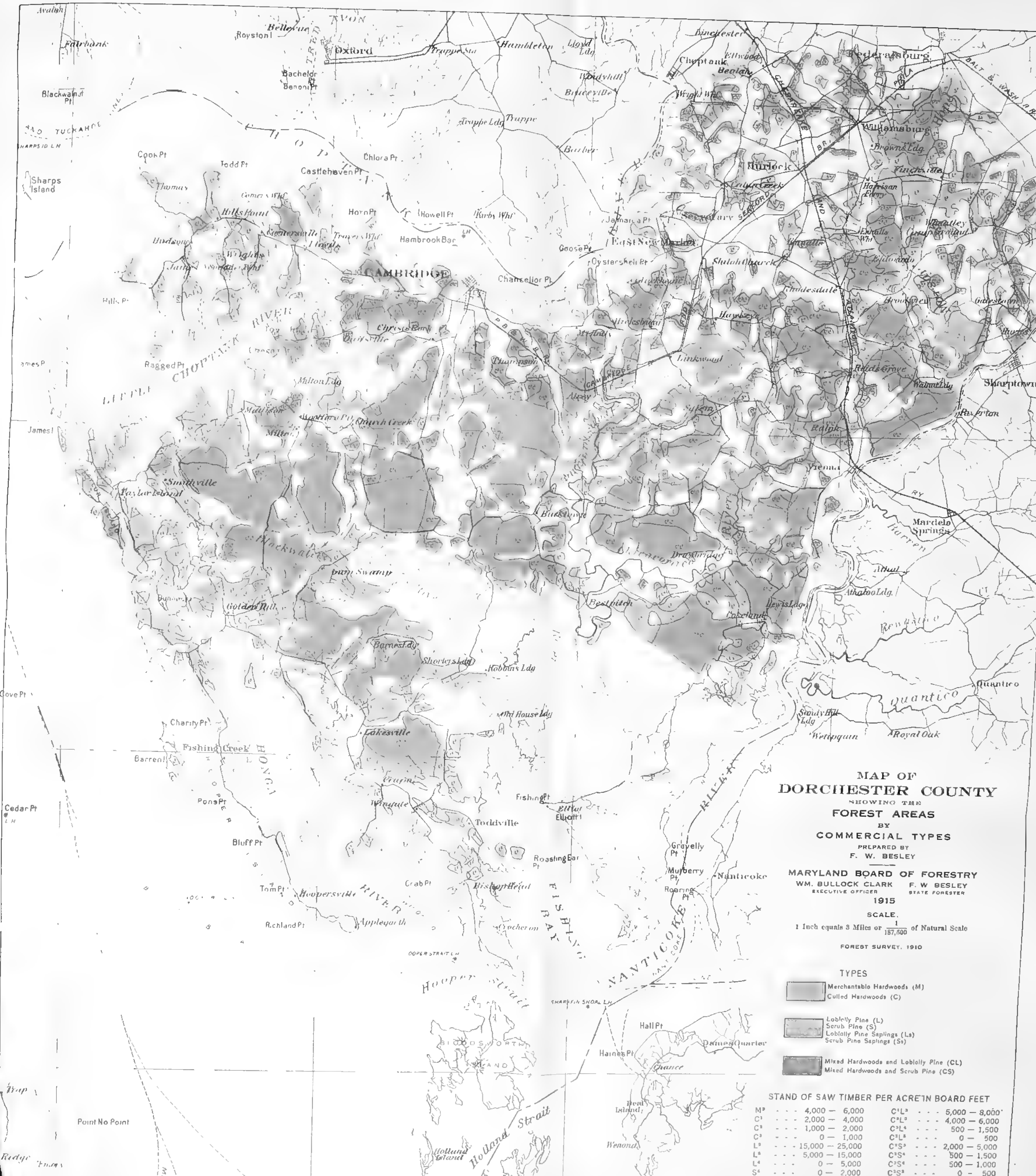
DORCHESTER COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	3,525,000 Board Feet	$19.00 per M	$66,975
Softwood	16,250,000 Board Feet	15.00 per M	245,250
Railroad Ties	6,000	.50 each	3,000
Piling	150,000 Lineal Feet	.08 per Foot	12,000
Cordwood	4,750 Cords	3.00 per Cord	14,250
Mine Props	810 Tons	3.00 per Ton	2,430
Poles	1,200	3.00 each	3,600
Shingles	50,000	4.50 per M	225
Lath	1,250,000	3.50 per M	4,375
Posts	1,500	.20 each	300
The County	2,231,160 Cubic Feet		$352,405

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	28,291	17,647	60	5,642	38,972	44,614	$22,568	$194,860	$217,428
2	15,894	3,961	24	1,607	14,806	16,413	6,428	74,030	80,458
3	23,978	12,730	50	14,836	22,932	37,768	59,344	114,660	174,004
4	20,694	9,872	37	3,847	26,729	30,576	15,388	133,645	149,033
5	41,489	13,390	32	7,685	42,723	50,408	30,740	213,615	244,355
6	9,948	1,605	16	.....	3,610	3,610	.....	18,050	18,050
7	25,806	9,585	32	7,448	22,759	30,207	29,792	113,795	143,587
8	14,706	5,049	34	402	18,708	19,110	1,608	93,540	95,148
9	21,628	11,242	50	7,552	27,367	34,919	30,208	136,835	167,043
10	26,854	2,671	9	.....	2,129	2,129	.....	10,645	10,645
11	29,744	10,931	37	2,896	15,162	18,058	11,584	75,810	87,394
12	10,061	3,067	30	1,369	8,236	9,605	5,476	41,180	46,656
13	32,121	10,096	31	9,203	21,633	30,836	36,812	108,165	144,977
14	12,783	4,620	36	2,970	8,774	11,744	11,880	43,870	55,750
15	20,196	4,959	24	1,789	12,709	14,598	7,156	63,545	70,701
16	11,657	7,079	61	2,283	22,802	25,085	9,132	114,010	123,142
17	22,809	9,787	40	11,495	5,254	16,749	45,980	26,270	72,250
The County	368,669	138,291	37	81,024	315,305	396,329	$324,096	$1,576,525	$1,900,621



MAP OF
DORCHESTER COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK EXECUTIVE OFFICER
F. W BESLEY STATE FORESTER
1915
SCALE.
1 Inch equals 3 Miles or $\frac{1}{187,500}$ of Natural Scale
FOREST SURVEY, 1910
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Loblolly Pine (L)
Scrub Pine (S)
Loblolly Pine Saplings (Ls)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M^3 - - - 4,000 — 6,000
C^1 - - - 2,000 — 4,000
C^2 - - - 1,000 — 2,000
C^3 - - - 0 — 1,000
L^3 - - - 15,000 — 25,000
L^2 - - - 5,000 — 15,000
L^4 - - - 0 — 5,000
S^4 - - - 0 — 2,000
C^1L^3 - - - 5,000 — 8,000
C^2L^3 - - - 4,000 — 6,000
C^3L^4 - - - 500 — 1,500
C^3L^5 - - - 0 — 500
C^2S^3 - - - 2,000 — 5,000
C^2S^4 - - - 500 — 1,500
C^3S^4 - - - 500 — 1,000
C^3S^5 - - - 0 — 500

FREDERICK COUNTY.

Frederick, the second largest County in the State, is the easternmost of the four counties which form "Western Maryland." It lies in and to the east of the Blue Ridge Mountains, extending from the Pennsylvania line on the north to the Potomac River on the south. The main topographic features are the Blue Ridge, with its higher elevations, South and Catoctin Mountains; the Monocacy River, which traverses the central part of the County from north to south; and several important agricultural valleys. The Frederick Valley is closely adjacent to the Monocacy River, and east of the Catoctins; the Middletown Valley lies between the latter and South Mountain, and in both sections the amount of forest land is relatively small, and agriculture highly developed. The highest points are in the northwestern part of the County, while the lower elevations are at the extreme south, near the mouth of the Monocacy.

Several principal types of soil occur in Frederick County. In the western district, which comprises the Catoctin and South Mountain sections, there is a brown, sandy loam, rich in organic matter, and fertile, but difficult of cultivation because of its stony character and the steep slopes where it occurs. Nevertheless, a great bulk of the County's forest area is found on this type of soil. In the central part, in what is known as the Frederick Valley, are the limestone soils which produce the County's best farm crops. The surface as a whole is rolling, well-watered and, except for the very mountainous portions, practically all in cultivation. The soils found in the eastern and southeastern sections of the County consist mostly of sandy loams, the greater part of which also are under cultivation, though not as productive as those of the central part.

The Forests.

The forest map of Frederick County shows that there are two principal divisions or areas of woodland in this County. In the west there is a considerable stretch of forested land, to a great extent unbroken, which extends from north to south; while in the east many scattered woodlots, usually of small size, make up the bulk of the wooded area. In the central and south-central parts there is, to a large extent, an

absence of forest land. Only 21 per cent of Frederick is wooded, and there are but three counties in Maryland possessing a greater relative area in improved agricultural lands.

The County's forests are practically all of hardwood growth. The only stands of pine of any consequence are one of mixed hardwood and pine in the Catoctin Mountains, west of Thurmont, another small area southeast of Motters, and one to the east of Buckeystown. The mountain forests are made up principally of chestnut and chestnut oak, white, black and scarlet oaks, hickory, tulip poplar and gum. The forests of the southeastern part of the County contain a much smaller percentage of chestnut, and a relatively larger amount of the oaks, with the exception of the chestnut oak, which is here less abundant than in the mountain section; there is practically no chestnut whatever in the Frederick Valley, or elsewhere, on limestone or limestone derivative soils.

The Catoctin Furnace, one of the oldest in Maryland making "charcoal iron," was established in 1774. During the American Revolution the Furnace supplied cannon and projectiles to the Continental Army, and until the end of the last century still operated about 10,000 acres of woodland near its location in the Catoctin Mountains, helping with other charcoal foundries of that time to give Maryland an important position in the iron industry.

The making of charcoal iron caused the clear cutting of extensive forested areas, with consequent sprout forests of even age which developed after the intensive cuttings of 20 to 100 years ago. Some of the best forest soils of the State are found in the Catoctins, but wherever forest fires have been frequent, as is apt to be the case in mountain sections, the forest growth is scrubby and of little value. This condition has also been intensified by the system of culling which has been practiced here for generations. The most important timber trees at present are the oaks, chestnut, tulip poplar, and hickory; along the crests of the mountains, the chestnut and chestnut oak; and farther down the slopes, on the deeper and richer soils, the scarlet and black oaks, white oak, red oak, hickory, and tulip poplar in varying proportions. In the deep and fertile valley soils excellent stands of white oak, red oak, tulip poplar, and other species occur, the improved condition of such forests in the non-mountainous areas being due in part to better soils, and somewhat to more efficient fire protection. The survey of 1911 shows that hardwoods constitute 99 per cent of Frederick's forest area, with the remaining 1 per cent in mixed hardwood and pine. There are 3,300 acres of hardwoods with an average stand of 5,000 or more board feet per acre, with 87,358 acres of hardwoods amounting to less than this; 62 acres of pine, all under 5,000 feet per

acre; and 397 acres of pine and hardwood stands, all of which are also below 5,000 feet.

USES OF THE FOREST.

The 51 saw mill and timber operators reported in 1914 a lumber cut of 809,965 cubic feet, having a value at points of production of $179,004. Of this, $130,894 represented the cut of lumber alone, with shingles, cordwood, railroad ties, pulpwood, lath, tanbark, piling, and export logs following in the order given. Portable mills are widely used in Frederick County, and it would seem that the timbered acreas are being thoroughly gone over for merchantable material.

In addition to these woods activities, there is considerable manufacturing and selling of lumber and various forest products in and around Frederick. Two yards and planing mills are located at Frederick, with only lumber yards at Adamstown, Brunswick, Burkittsville, Emmitsburg, Thurmont, Walkersville, and Woodsboro. There are also in Brunswick two casket manufactories, and in Frederick City a tannery, a silo plant, and a fibre-brush factory, these different industries, all told, handling annually 14,500,000 board feet of wood, and employing an average of 460 men. The 51 sawmill and other operators produce but *7,283,000* board feet of lumber, one-half the consumption of the County, so that opportunities evidently exist for developing the local output. Excellent highways traverse Frederick County, which, with the 18 miles of trolley lines and the 90 miles of railway, combine to make timber accessible in all sections of the county.

Frederick County, as has already been stated, is highly developed along agricultural lines. The land is fertile and well-farmed, and only in the forest areas is there much need of improved methods of management. These, however, have been continuously damaged by forest fires for many years. Their protection and improved management would add substantially to the whole County's productiveness and revenues.

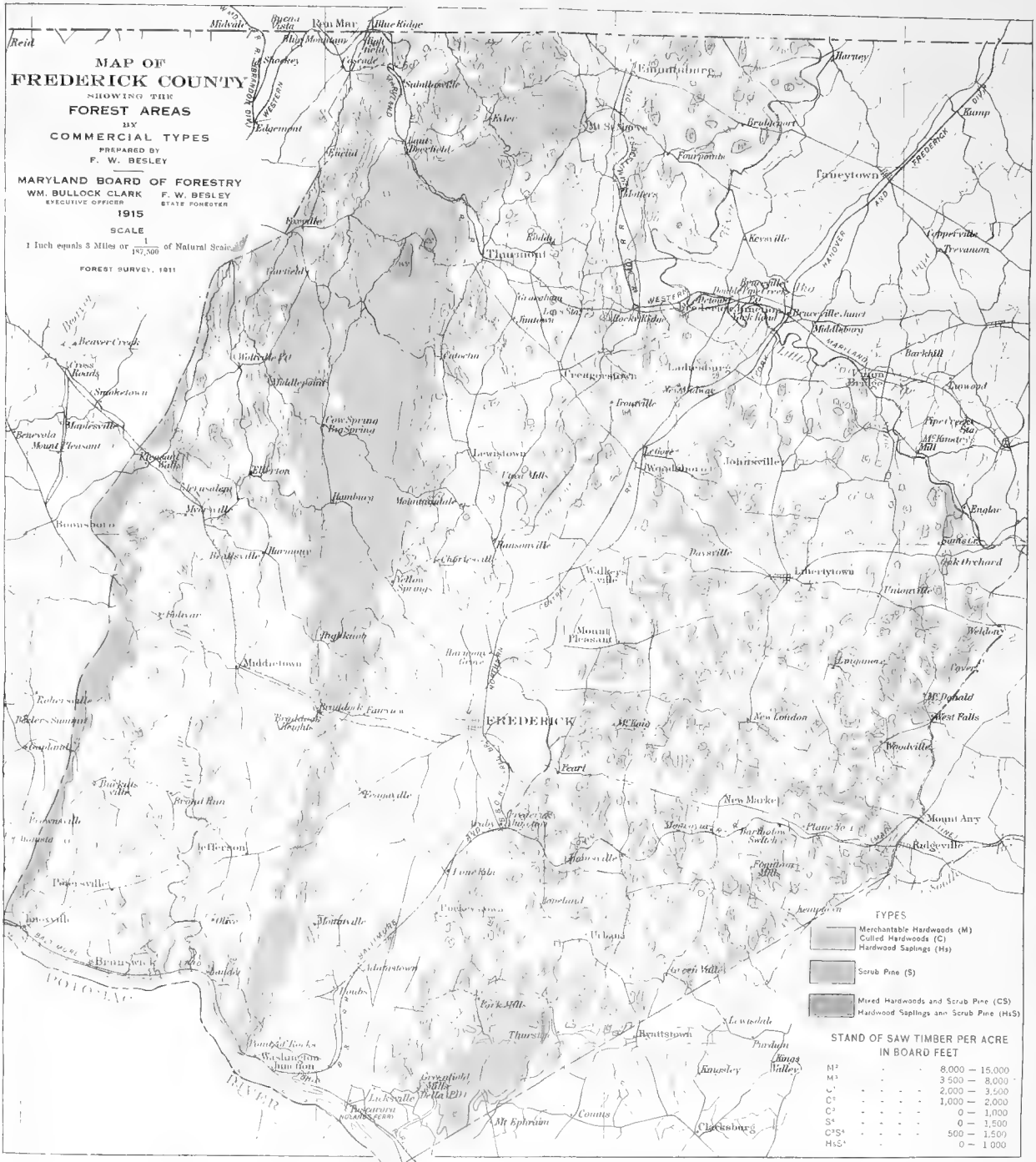
FREDERICK COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	7,183,000 Board Feet	$18.00 per M	$129,294
Softwood	100,000 Board Feet	16.00 per M	1,600
Pulpwood	600 Cords	6.50 per Cord	3,900
Railroad Ties	15,000	.55 each	8,250
Piling	12,000 Lineal Feet	.10 per Foot	1,200
Cordwood	4,600 Cords	3.25 per Cord	14,950
Tan Bark	160 Tons	8.50 per Ton	1,360
Shingles	3,500,000	4.50 per M	15,750
Lath	600,000	3.25 per M	1,950
Export Logs	25,000	30.00 per M	750
The County	809,965 Cubic Feet		$179,004

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.50 per M.	Pine $4.50 per M.	Total $
1	32,004	838	3	2,534	.....	2,534	$11,403	.....	$11,403
2	14,269	19	.....	76	.....	76	342	.....	342
3	19,656	1,493	8	2,446	.....	2,446	11,007	.....	11,007
4	12,663	756	6	1,636	6	1,642	7,362	$27	7,389
5	30,303	5,066	17	9,215	19	9,234	41,467	86	41,553
6	16,782	8,494	51	12,487	.....	12,487	56,192	.....	56,192
7	31,405	7,743	25	14,262	38	14,300	64,179	171	64,350
8	14,679	2,174	15	3,474	.....	3,474	15,633	.....	15,633
9	32,130	5,399	17	8,839	.....	8,839	39,775	.....	39,775
10	18,818	10,692	57	10,401	.....	10,401	46,805	.....	46,805
11	17,558	1,342	8	3,303	.....	3,303	14,863	.....	14,863
12	11,655	1,412	12	2,876	.....	2,876	12,942	.....	12,942
13	12,348	2,378	19	3,123	.....	3,123	14,054	.....	14,054
14	16,254	2,892	18	4,520	.....	4,520	20,340	.....	20,340
15	24,538	12,695	52	9,463	198	9,661	42,583	891	43,474
16	14,802	3,686	25	5,779	.....	5,779	26,006	.....	26,006
17	17,514	1,405	8	3,068	.....	3,068	13,806	.....	13,806
18	16,380	3,106	19	4,539	.....	4,539	20,425	.....	20,425
19	11,403	1,903	17	3,625	.....	3,625	16,313	.....	16,313
20	19,845	8,366	42	7,264	.....	7,264	32,688	.....	32,688
21	12,127	5,181	43	7,810	.....	7,810	35,145	.....	35,145
22	11,718	1,783	15	3,062	.....	3,062	13,779	.....	13,779
23	8,316	693	8	630	.....	630	2,835	.....	2,835
24	5,040	1,002	20	1,188	.....	1,188	5,346	.....	5,346
25	1,108	25	2	69	.....	69	310	.....	310
26	9,815	574	6	1,001	.....	1,001	4,505	.....	4,505
The County	433,130	91,117	21	126,690	261	126,951	$570,105	$1,175	$571,280


MAP OF
FREDERICK COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1911
FREDERICK
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine (S)
Mixed Hardwoods and Scrub Pine (CS)
Hardwood Saplings and Scrub Pine (HsS)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M¹ - - - 8,000 — 15,000
M² - - - 3,500 — 8,000
C¹ - - - - - 2,000 — 3,500
C² - - - - - 1,000 — 2,000
S¹ - - - - - 0 — 1,000
S² - - - - - 0 — 1,500
C²S¹ - - - - 500 — 1,500
HsS¹ - - - 0 — 1,000

GARRETT COUNTY.

Garrett, the westernmost County of Maryland, is in shape a right-angled triangle, with the angle at the northwest corner, which touches Pennsylvania, while the remainder of the County is bordered on the west and south by West Virginia and the Potomac River. Four prominent mountain ridges occur, all showing a northeasterly and southwesterly trend, the most important of the group being Backbone Mountain, the highest point in Maryland, with its continuation as Big Savage, the two separated by the gorge of the Savage River. This ridge attains an elevation of about 3,400 feet in the southwestern end of the County, with an average height maintained of close to 3,000 feet throughout, where for about half way it separates the drainage of the Potomac and Youghiogheny systems, the latter a tributary of the Monongahela. The County possesses no navigable watercourse, but an abundance of good-sized streams, hitherto undeveloped, which offer good future possibilities as power sites.

With the exception of the "glades," which make up a considerable portion of poorly drained lands in the valleys, all of this County's soils will support good growths of timber. That along the crests of the mountains is of course somewhat thin and less productive, but on the lower slopes and in the valleys there is almost invariably a sandy loam of considerable depth, with the best agricultural situations in the valleys between Backbone Mountain on one side and Hoop Pole Ridge and Meadow Mountain on the other, and farther west, between Winding Ridge and Negro Mountain.

The Forests.

The woodlands of the County comprise 63 per cent of its total area, the highest percentage of woodland of any County in the State. Forests cover practically all of the prominent mountain ridges, with woodlots of varying sizes well distributed over the farms in the valleys. It is quite certain that the entire County, with the exception of the glades, was once well wooded, but the high quality of the land early attracted the settler, and the constant influx of immigration from that time on soon cleared of forest the most suitable farm lands. The forests receded from the valleys, and are now principally re-

stricted to the mountains and more rugged slopes. Today the bulk of the woodland is in relatively large holdings usually in the possession of coal or lumber companies.

The County was at one time a magnificent forest of virgin white pine and hemlock, oak, maple, chestnut, and other of the hardwoods, but subsequent culling of the best, together with great damage from forest fires, have largely prevented the cut-over lands from producing a high character of forest growth, in many cases none at all. Present forests consist principally of young growth with scattered older trees, the latter nearly always more or less unmerchantable and not considered fit for cutting in previous operations. Outside of the white oak type of forest, which occupies the clay soils in the west-central part, the forest types are largely determined by conditions of exposure and drainage. Along the crests of the mountains chestnut, birch, chestnut oak, and scarlet oak predominate, while farther down, along ravines, sugar maple, beech, white oak, basswood, cucumber, and in moist situations hemlock, are frequently found. When the Forest Survey was made in 1913, hardwood stands of timber amounted to 98 per cent of the whole in Garrett County, with 1 per cent of the wooded area in pine, and 1 per cent in mixed hardwood and pine. On the 274,483 acres of forest land there is a total stand of 447,766,000 board feet of timber. According to this survey, hardwood stumpage of 5,000 or more board feet per acre occupies 4,484 acres, of less than 5,000, 264,112 acres; pine and hemlock stands, on the same basis, occur on 1,464 and 617 acres, respectively; mixed hardwood, hemlock, and pine, 2,529 and 1,277 acres.

USES OF THE FOREST.

In the early days when there were no good roads and often none at all, immense forests and few people to make use of them, only the choicest timber could be or was removed, and that from the most accessible places. Later, when there began a greater and more profitable demand for timber, and the undeveloped country to be opened up, cutting could be carried farther back in the hills, and soon inaugurated a more rapid depletion of the forests. Forest fires usually followed the lumbering operations in the slashings, and from that time to the present have undoubtedly destroyed more timber than has actually been cut. The timber business has been the County's most important industry for over 50 years, but reckless methods of operation, coupled with the destruction brought about by fires, is placing this industry on a most unstable footing.

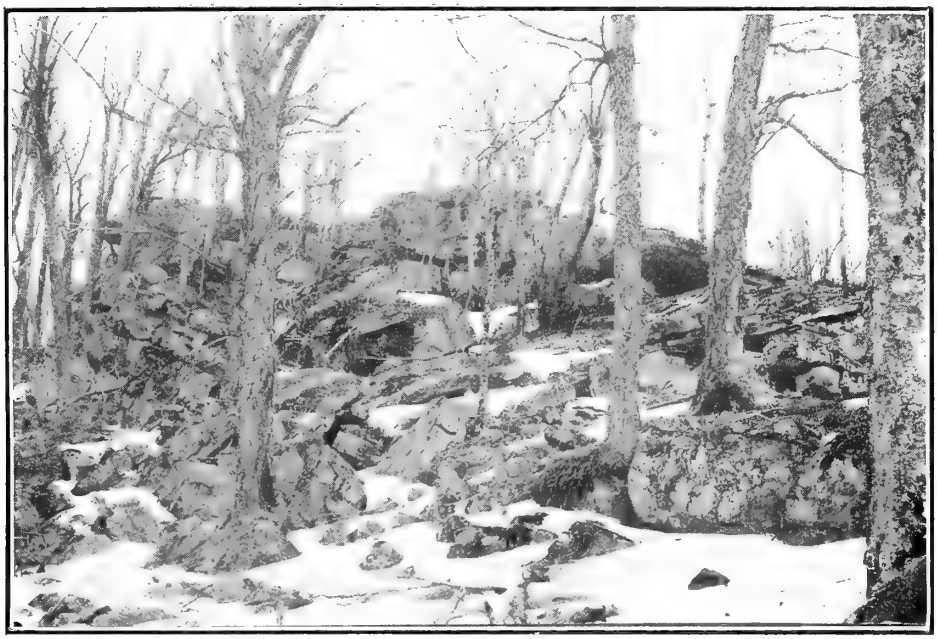


PLATE XII. FIG. 1.—THE TYPICAL MOUNTAIN FOREST.

Such forests— growing where nothing else will grow — serve the double purpose of timber production and watershed protection.

PLATE XII. FIG. 2.—FROM THE FIRE TOWER — MEADOW MOUNTAIN.

Several ranges of mountains and thousands of acres of woodland appear, and the forests of Western Maryland are seen at their best.

Yet in the face of this the timber cut for the County in 1914, 7,750,245 cubic feet, had a value at points of production of $1,379,937. It is the highest in the State. Local forests are being drawn upon for a diversity of products—lumber, tanbark, mine props, mine ties, railroad ties, lath, piling, pulpwood, shingles, poles, cordwood and posts, to name them in order of value. The cut of lumber represents the production of some 62 mills, most of them the portable kind, while the lath is a by-product in some of the mills that are large enough to utilize their slabs and edgings. The cutting of ties for railroad and mine use is largely a field belonging to smaller operators, while the demand for mine props in the bituminous regions makes another forest industry of some value to the individual farmer and small timberman.

There are 55 miles of railway in this County, with another line, the Western Maryland, following the entire southern boundary. This, together with a considerable mileage of recently improved highways, is proving of much value to owners of woodland in opening up forested districts which it was hitherto unprofitable to log. Garrett does not manufacture any great amounts of wood, the manufacturers being represented by planing mills and yards at Crellin, Friendsville, and Mt. Lake Park.

The present lack of good forest management means a real loss to the County of an annual revenue amounting at the least to $650,000. Well regulated forest management, moreover, cannot successfully be introduced until reasonable fire protection is assured, since there is small inducement to make an investment for the improvement of the forest where there is more than an even chance that a fire may at any time destroy the forest, together with any improvements which care and good management have brought about. There is much, however, which may be done by the individual woodland owner until such time as more concerted action, publicly, shall have placed the forests of this County on firm financial basis.

A force of State Forest Wardens and Federal Patrolmen is endeavoring to extend efficient service to the County in this respect, but the complete co-operation of every county resident is requisite toward making this in every way successful; favorable conditions are extant for a good natural growth of timber, with but little necessity for planting or otherwise artificially supplementing natural reproduction. The principal consideration is to so guide the development of the young growth that the resulting older forests may be quickly matured, and of a quantity and quality consistent with successful forestry.

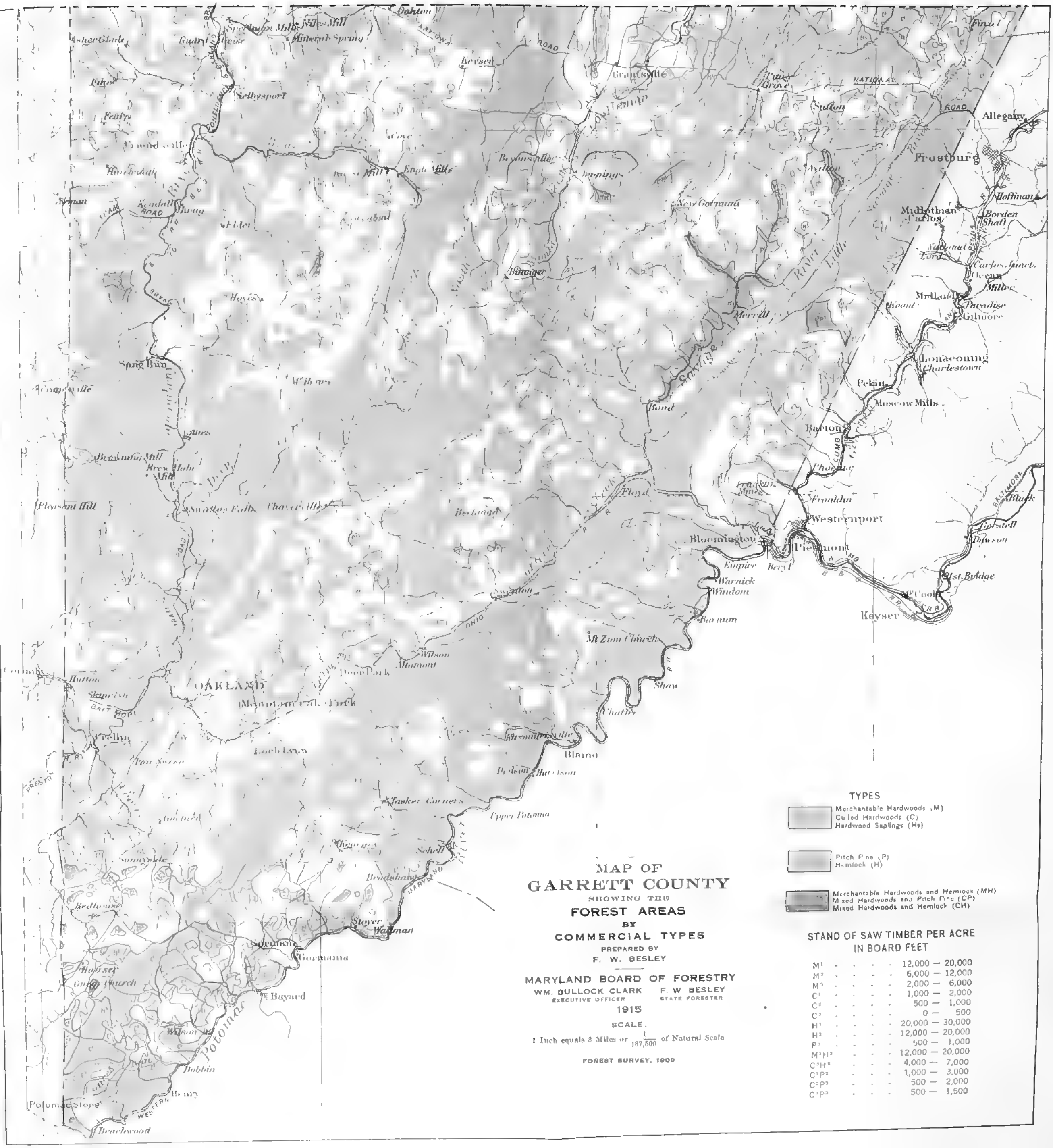
GARRETT COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	48,279,000 Board Feet	$18.00 per M	$869,022
Softwood	11,744,000 Board Feet	14.00 per M	164,416
Pulpwood	1,250 Cords	6.50 per Cord	8,125
Railroad Ties:			
White Oak	21,834	.70 each	15,284
Mixed Oak	12,600	.45 each	5,670
Chestnut	14,000	.20 each	2,800
Piling	54,000 Lineal Feet	.20 per Foot	10,800
Cordwood	750 Cords	3.00 per Cord	2,250
Mine Props	17,280 Tons	2.50 per Ton	43,200
Tan Bark: Oak	7,125 Tons	7.00 per Ton	49,875
Hemlock	21,375 Tons	7.00 per Ton	149,625
Poles	850	4.00 each	3,400
Shingles	785,000	4.50 per M	3,532
Lath	7,650,000	2.75 per M	21,038
Mine Ties	200,000	.15 each	30,000
Posts	4,500	.20 each	900
The County	7,750,245 Cubic Feet		$1,379,937

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	44,339	33,155	75	31,486	312	31,798	$125,944	$1,560	$127,504
2	37,682	19,640	52	25,794	.....	25,794	103,176	.....	103,176
3	54,780	33,663	61	84,352	7,148	91,500	337,408	35,740	373,148
4	27,027	17,739	65	30,847	.....	30,847	123,388	.....	123,388
5	29,941	12,953	43	15,835	.....	15,835	63,340	.....	63,340
6	37,009	25,751	70	36,021	.....	36,021	144,084	.....	144,084
7	15,762	5 526	35	8,882	.....	8,882	35,528	.....	35,528
8	44,432	23,539	53	36,884	.....	36,884	147,536	.....	147,536
9	20,021	16,921	85	22,323	.....	22,323	89,292	.....	89,292
10	26,890	16,191	60	15,219	.....	15,219	60,876	.....	60,876
11	21,301	13,650	64	49,606	7,944	57,550	198 424	39,720	238,144
12	26,902	18 172	68	34,451	247	34,698	137,804	1,235	139,039
13	11,614	8,731	75	12,299	.....	12,299	49,196	.....	49,196
14	38,921	28,852	74	28,116	.....	28,116	112,464	.....	112,464
The County	436,621	274,483	63	432,115	15,651	447,766	$1,728,460	$78,255	$1,806,715



MAP OF
GARRETT COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W BESLEY
STATE FORESTER
1915
SCALE.
FOREST SURVEY, 1909
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Pitch Pine (P)
Hemlock (H)
Merchantable Hardwoods and Hemlock (MH)
Mixed Hardwoods and Pitch Pine (CP)
Mixed Hardwoods and Hemlock (CH)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M¹ 12,000 — 20,000
M² 6,000 — 12,000
M³ 2,000 — 6,000
C¹ 1,000 — 2,000
C² 500 — 1,000
C³ 0 — 500
H¹ 20,000 — 30,000
H² 12,000 — 20,000
P³ 500 — 1,000
M¹H² 12,000 — 20,000
C¹H² 4,000 — 7,000
C¹P² 1,000 — 3,000
C²P³ 500 — 2,000
C¹P³ 500 — 1,500
Oakton
Grantsville
Frostburg
Allegany
Hoffman
Midlothian
Barton
Moscow Mills
Lonaconing
Charlestown
Westernport
Piedmont
Bloomington
Keyser
OAKLAND
Mountain Lake Park
Deer Park
Altamont
Wilson
Swallow Falls
Gormania
Bayard
Potomac
Dobbin
Beachwood
Kitzmiller
Blaine
Shaw
Barnum
Empire
Franklin
Phoenix
Loch Lynn
Hutton
Bond
Merrill
Accident
Selbysport
Friendsville

HARFORD COUNTY.

Harford County lies in the northeastern section of the State, extending to Pennsylvania on the north, the Susquehanna River on the east, Chesapeake Bay on the south, and the Gunpowder on the west. The northern four-fifths of the County is in the Piedmont Plateau, and ranges in elevation from 200 to 700 feet above sea level, with gently rolling to hilly land, and generally rapid streams. The southern fifth lies in the Coastal Plain and varies from 10 to 90 feet in altitude; it is generally flat, and supplied with broad tidal streams and sluggish creeks.

The soils of the Piedmont division vary considerably, there being three general types—the clays, extending irregularly through the central and northeastern parts of the County, and forming a soil which is good, but often difficult of tillage because of large, scattered boulders; the loams, which constitute by far the larger area of any of the soil types in the northern section, and also in the southern or Coastal Plain division, in both regions constituting the most productive soils; and in the third division, which is just north of the Baltimore & Ohio Railroad, largely gravelly soils merging into clays. The latter type is covered almost entirely by forest, and is considered of the least value for agricultural purposes. There is much of the County's soil that is unsuited to agriculture, indicating that a large portion of the County should always remain in forest growth.

The Forests.

Two hundred years ago the County was heavily forested with tree species of much present-day commercial value, although at that time they possessed little or none because of their abundance. At the present the forest areas are limited largely to the hilly or stony areas that are relatively unsuited to tillage, 29 per cent of the County being now in forest growth. The woodland is quite well distributed over the entire area, and there are few very extensive stands, the only noteworthy ones being in the vicinity of Rocks and Dublin, with a strip extending through the County along and north of the Baltimore & Ohio, and others through the two peninsulas of the Coastal Plain division.

Much of the woodland is in farm woodlots of 10 to 100 acres each, representing the non-arable land that is too steep and rocky for agricultural use. Clearing is in progress in many sections and will likely continue throughout the County, and very little land that has been once cleared and cultivated is allowed to revert to forest. Existent forests are almost entirely of the mixed hardwood type, and on the strong soils their growth is relatively rapid. There is noticeable considerable variation in the mixed hardwoods, due largely to topography and, to some extent, the character of the soil. The most apparent difference in this respect is the fact that chestnut, the most important species in the upper end of the County, rarely occurs in the southern section. The principal associates occurring with chestnut in the northeastern part are chestnut oak, Spanish and black oaks, hickory and black gum, and all occur on ridges or soils where drainage is good. Along the watercourses and lower slopes adjacent to streams, where the soils are deep and fertile, the more common species are tulip poplar, red oak and white oak. In the tidal or southern part of the County, where the land is more or less swampy, red gum, black gum, pin oak and red maple are the principal timber trees. In the vicinity of Rocks there is a considerable amount of chestnut and chestnut oak coppice, the result of cutting for charcoal to supply the iron furnace operated here many years ago. Of the two gums occurring, the black gum is the more common, being scattered pretty generally through the forests of the entire County, while the red gum is found only in the Coastal Plain division, often, in wet, swampy lands, forming a practically pure stand.

Of the County's entire wooded area, it was shown by the survey of 1909 that 99 per cent is in mixed hardwood growth and only 1 per cent in pine. There are 6,303 acres of the former which have stands amounting to 5,000 or more board feet to the acre, 75,234 acres having stands of less than this; of the pine, there are only 335 acres of less than 5,000 feet.

USES OF THE FORESTS.

The combined cut of the 27 sawmill and timber operators of Harford County, in 1914, was 774,555 cubic feet of wood, with a value of $118,342. Lumber of course makes up the great bulk of this, both as to amount and value, being followed by poles, railroad ties, cordwood, piling, pulpwood, posts, shingles and lath. Harford has been one of the Counties seriously affected by the chestnut blight, and it is partly due to this that the County's present cut of chestnut for poles has

reached so large a figure. Chestnut is the most suitable of local woods for this use, and a ready market for such stock has materially assisted in disposing of timber attacked by the blight. But on account of the prevalence of this disease, the best prices have not always obtained on the material sold. A good market for ties has also been created by the 62 miles of railway which traverse the County.

Manufacturers and dealers in wood are not particularly numerous or important here, although there are yards at Bel Air, Cardiff, Fallston, Havre de Grace, Lapidum and Perryman, which represent this branch of the lumber business in Harford County. The County as a whole possesses good markets and excellent means of transportation, both by water and rail, so that the forest industry contributes substantially to its general wealth and agricultural prosperity.

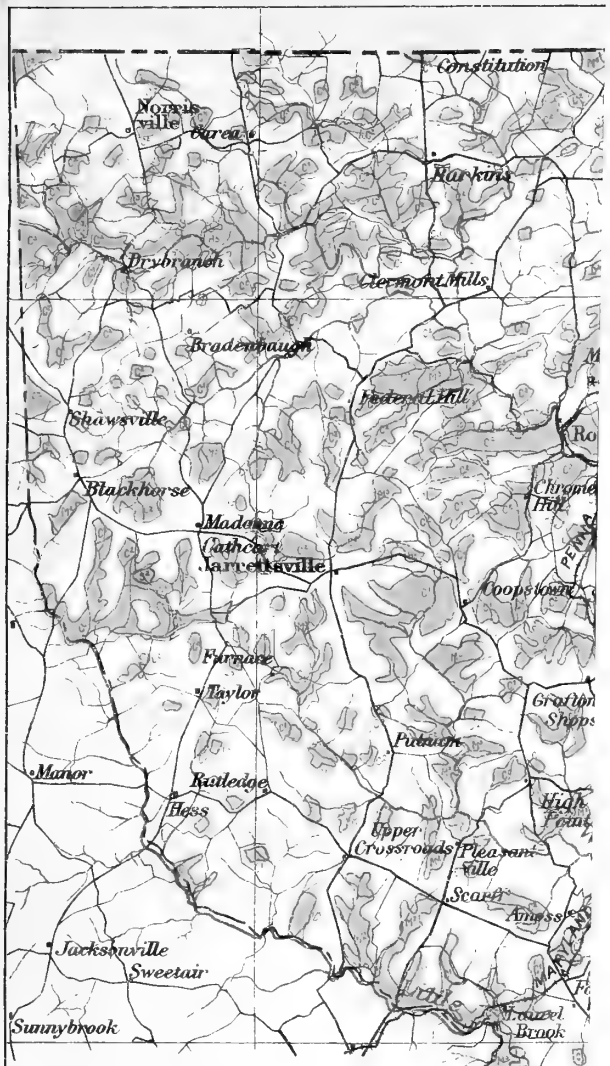
HARFORD COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	4,274,000 Board Feet	$17.00 per M	$72,658
Pulpwood	667 Cords	7.00 per Cord	4,669
Railroad Ties:			
Mixed Oak	16,475	.65 each	10,709
Chestnut	9,675	.25 each	2,419
Piling: Oak	36,750 Lineal Feet	.10 per Foot	3,675
Pine	20,250 Lineal Feet	.10 per Feet	2,025
Cordwood	2,050 Cords	3.25 per Cord	6,663
Poles	4,590	3.00 each	13,770
Shingles	150,000	4.25 per M	637
Lath	125,000	3.25 per M	406
Posts	5,925	.12 each	711
The County	774,555 Cubic Feet		$118,342

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $.
1	42,265	19,809	47	37,720	96	37,816	$188,600	$480	$189,080
2	65,730	16,422	25	38,790	.....	38,790	193,950	.....	193,950
3	58,394	14,877	25	25,322	8	25,330	126,610	40	126,650
4	64,522	16,017	25	25,460	44	25,504	127,300	220	127,520
5	52,098	14,747	28	19,912	.....	19,912	99,560	.....	99,560
The County	283,009	81,872	29	147,204	148	147,352	$736,020	$740	$736,760



MAP OF HARFORD COUNTY

SHOWING THE

FOREST AREAS

BY

COMMERCIAL TYPES

PREPARED BY

F. W. BESLEY

MARYLAND BOARD OF FORESTRY

WM. BULLOCK CLARK, EXECUTIVE OFFICER

F. W. BESLEY, STATE FORESTER

1915

SCALE:

1 Inch equals 3 Miles or $\frac{1}{187,500}$ of Natural Scale

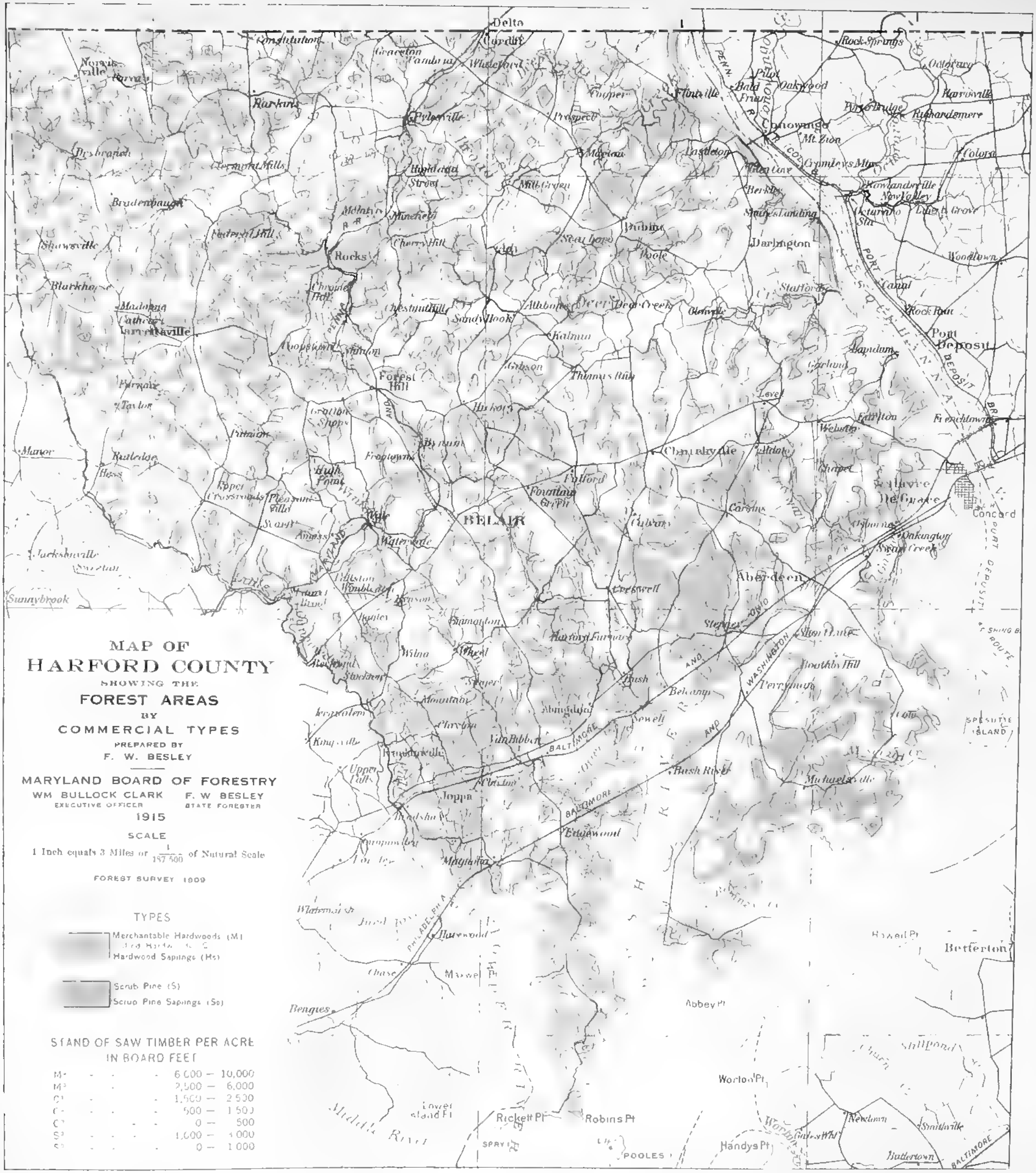
FOREST SURVEY, 1909

TYPES

- Merchantable Hardwoods (M)
  Culled Hardwoods (C)
  Hardwood Saplings (Hs)
- Scrub Pine (S)
  Scrub Pine Saplings (Ss)

STAND OF SAW TIMBER PER ACRE IN BOARD FEET

M^2	6,000 — 10,000
M^3	2,500 — 6,000
C^1	1,500 — 2,500
C^2	500 — 1,500
C^3	0 — 500
S^2	1,000 — 3,000
S^3	0 — 1,000


MAP OF
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TYPES
Merchantable Hardwoods (M)
Hardwood Saplings (Hs)
Scrub Pine (S)
Scrub Pine Saplings (Ss)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
6,000 — 10,000
2,500 — 6,000
1,500 — 2,500
500 — 1,500
0 — 500
1,000 — 4,000
0 — 1,000
BELAIR
Aberdeen
Havre de Grace
Port Deposit
Darlington
Delta
Joppa
Edgewood
Betterton

HOWARD COUNTY.

Howard, one of the smallest counties of the State, lies in the central portion, between the Patapsco and Patuxent Rivers. It is in the Piedmont Plateau, though adjacent to the Coastal Plain. The surface is rolling to hilly, and well-watered, with soil of exceptional quality. Seventy-one per cent of the total surface is improved farm land under tillage, in this respect ranking third in Maryland. Local soils are generally of the loam type, which is well adapted for general farming where surface conditions permit. There is, however, a fair amount of absolute forest land, which, due to quality of soil and efficient fire protection, is at present quite productive.

The Forests.

Of the county's entire area, 25 per cent is classed as wooded, there being a very even distribution of forest lands throughout the county. They are frequently in small areas owned by farmers, and in general well cared for by them. Oak predominates, and there are numerous heavy stands of timber in the central and northern parts; in the southern section, where transportation facilities have been better, the forests are more severely culled, and the resulting stands of timber not so heavy. The forests are nearly all of the mixed hardwood type, with the pine stands confined almost exclusively to the southeastern part, where the Coastal Plain and Piedmont formations overlap. The pine found here is the scrub pine, a tree of low timber value. Mixed oaks are most important, and next to them are tulip poplar, hickory and chestnut, although as compared to some of the adjacent counties there is very little of the latter here.

The forests of Howard County are 96 per cent hardwood, according to the survey made in 1910, with only 4 per cent of pure pine stands. Of this, 9,399 acres contain stands of 5,000 board feet upward, and 27,709 acres of timber amounting to less than this. The stands of pine, 1,536 acres in extent, are all of less than 5,000 board feet per acre.

Uses of the Forests.

Looked at comparatively, the forest industries of this county are by no means unimportant for its size. The cut in 1914 of the 12 saw-

mills, and other operators, aggregated 599,455 cubic feet, with a value of $64,696. Lumber ranked first, followed by cordwood, shingles, railroad ties, pulpwood, poles, and piling. The amount of cordwood cut and sold is no doubt in part accounted for by the proximity of the Baltimore City market, while the sale of pulpwood is something new as a local forest industry. The markets available for the other products are most excellent, and would probably be able to absorb any increased production which better forest management might bring about in this locality.

There are lumber yards at Elkridge and Ellicott City, but no other wood-using industries worthy of mention in the county. With improved systems of State and County highways, and the 44 miles of railway lines also passing through this county, it is possible to market the raw material advantageously at other points, so that the manufacturing branch of this business has received but little attention here. With the markets of Baltimore and Washington so easily accessible, there is every inducement for the practice of better forest management in Howard County.

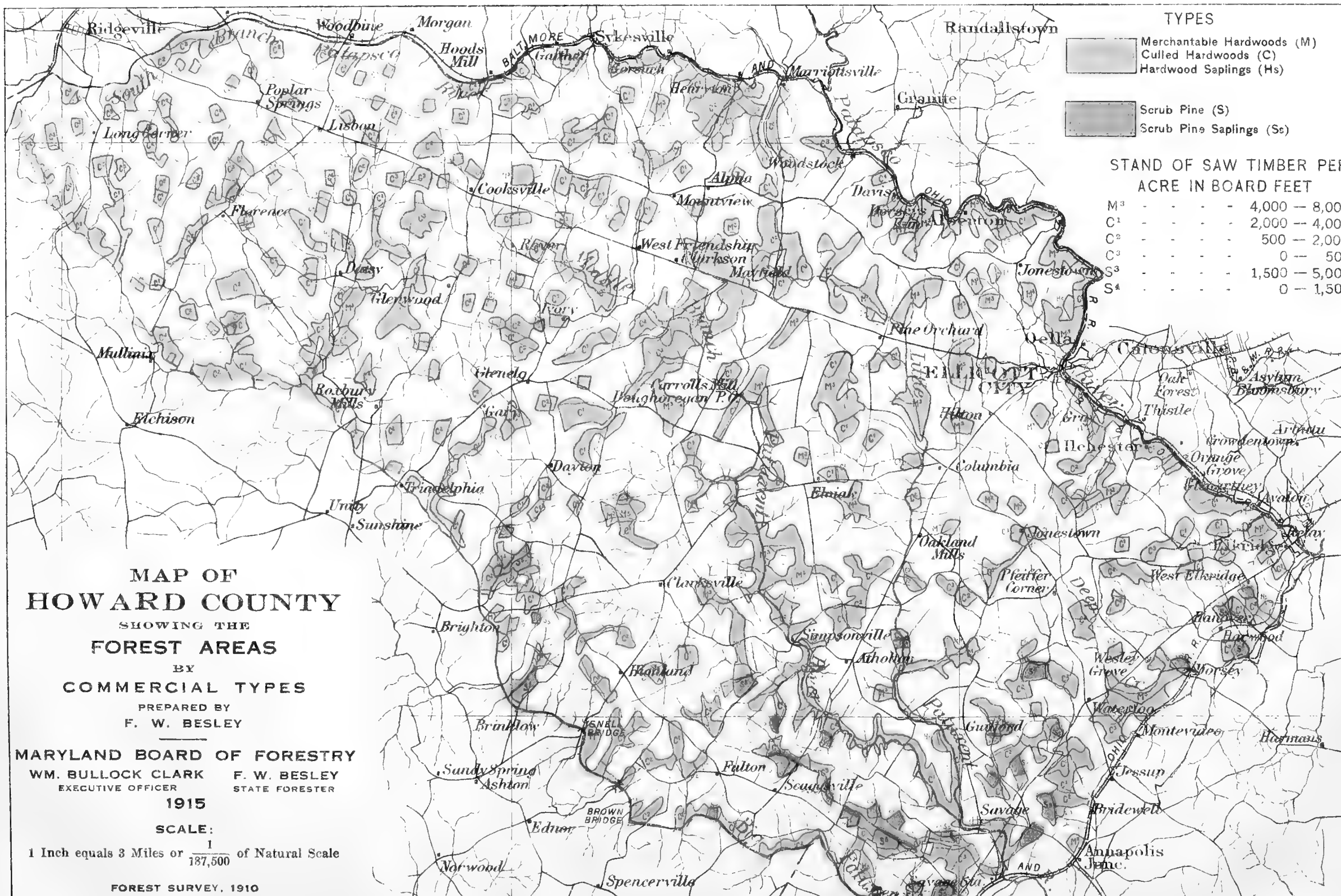
HOWARD COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	1,884,000 Board Feet	$18.00 per M	$33,912
Softwood	93,000 Board Feet	15.00 per M	1,395
Pulpwood	500 Cords	6.50 per Cord	3,250
Railroad Ties	8,500	.50 each	4,250
Piling	20,000 Lineal Feet	.10 per Foot	2,000
Cordwood	3,700 Cords	3.50 per Cord	12,950
Poles	800	3.00 each	2,400
Shingles	1,068,000	4.25 per M	4,539
The County	599,455 Cubic Feet		$64,696

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	12,561	3,396	27	8,024	14	8,038	$40,120	$70	$40,190
2	19,621	5,323	27	24,417	30	24,447	122,085	150	122,235
3	27,741	7,697	28	22,917	20	22,937	114,585	100	114,685
4	39,699	8,070	20	12,280	10	12,290	61,400	50	61,450
5	36,349	8,580	24	22,793	14	22,807	113,965	70	114,035
6	23,471	5,588	24	8,787	22	8,809	43,935	110	44,045
The County	159,442	38,644	25	99,218	110	99,328	$496,090	$550	$496,640


MAP OF
HOWARD COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1910
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine (S)
Scrub Pine Saplings (Sc)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M3 - - - - - 4,000 — 8,000
C1 - - - - - 2,000 — 4,000
C2 - - - - - 500 — 2,000
C3 - - - - - 0 — 500
S3 - - - - - 1,500 — 5,000
S4 - - - - - 0 — 1,500
Ridgeville
Woodbine
Morgan
Hoods Mill
Sykesville
Randallstown
Marriottsville
Granite
Poplar Springs
Lisbon
Cooksville
Woodstock
Alpha
Mountview
West Friendship
Florence
Daisy
Glenwood
Mullinix
Roxbury Mills
Glenelg
Etchison
Triadelphia
Unity
Sunshine
Dayton
Pine Orchard
Jonestown
Oella
Catonsville
Ellicott City
Columbia
Ilchester
Orange Grove
Avalon
Relay
Elkridge
Oakland Mills
Pfeiffer Corner
West Elkridge
Clarksville
Simpsonville
Atholton
Brighton
Highland
Guilford
Waterloo
Montevideo
Harmans
Jessup
Savage
Bridewell
Annapolis Junc.
Brinklow
Sandy Spring
Ashton
Fulton
Scaggsville
Ednor
Norwood
Spencerville
Gaither
Forsyth
Henryton
Davis
Long Corner
Carrolls Mill
Doughoregan P.O.
Oak Forest
Thistle
Asylum
Bloomsbury
Arbutus
Grove
Hanover
Harwood
Dorsey
Wesley Grove
Clarkson
Mayfield
Ivory
Elioak
Daisy
Savage Sta.
Laurel
SNELL BRIDGE
BROWN BRIDGE
BALTIMORE AND OHIO R. R.
Patuxent
Patapsco River
Little Patuxent
Deep Cr.

chestnut, and locust. Of the three types of forest in the county, the mixed hardwood covers 97 per cent of the entire area; mixed hardwood and pine, 2 per cent, and pine, 1 per cent, being found in only three and two districts, respectively. There are 33,776 acres of forest in Kent County, and the stand of timber is 50,019,000 board feet. Of this, the survey of 1907 showed that there were 6,787 acres of hardwood amounting to 5,000 feet or over to the acre, and 26,063 acres of less than this; 483 acres of mixed hardwood and pine of less than 5,000 feet; and 443 acres of pure pine, also under 5,000 feet per acre.

USES OF THE FORESTS.

Saw timber in this county has become so scarce that practically all species of any commercial importance are now cut and marketed for lumber, the 1914 cut of 10 local mills amounting to 1,326,000 board feet of pine and hardwood. Other than this the cut consisted of railroad ties, fence posts, piling, cordwood, pulpwood, poles, mine props, and shingles, these products being given here in order of their relative value. The total cut was 382,870 cubic feet, worth $53,047, and represents the output of the millmen, and many smaller operators or individual farmers. The sawmills are nearly all of the small portable kind, which move from place to place wherever stumpage is obtainable; most of the timber cut is used at home, and much is imported for construction purposes in addition to that which is locally supplied. The 30 miles of railroad lines constitute a readily available market for cross-ties, the high prices paid furnishing a strong incentive to cut young timber which has not fully matured, either financially or otherwise; the demand for telegraph and telephone poles has caused most of the chestnut suitable for that purpose to be removed; posts to the number of 36,000 were used for renewing old fence lines and building new ones in the county; while the quantity of wood used for fuel is always an item of some importance here. Other forest products gotten out in lesser amounts were piling, mine props, shingles and pulpwood. At Chestertown and Rock Hall alone there are wood-using establishments which annually convert over 1,500,000 feet of rough material to manufactured products which include baskets, barrels, crates, flooring, ceiling, interior finish, window and door frames, but in this county, as elsewhere, the producing end of the timber business if of greater importance than the industries which manufacture wood or timber.

This being so, it lends emphasis to the fact that in view of present forest conditions a greatly increased timber output would be possible

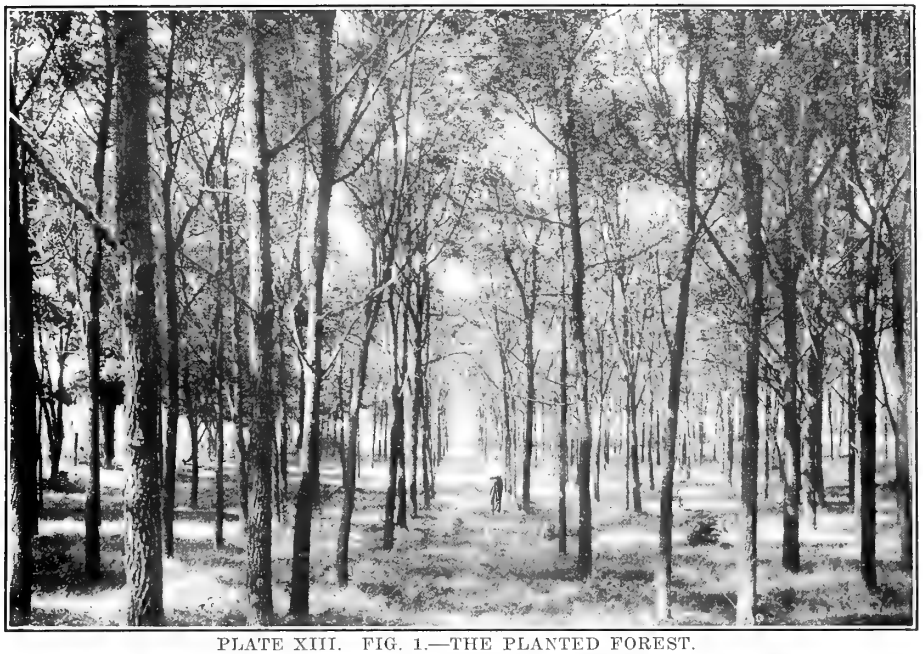


PLATE XIII. FIG. 1.—THE PLANTED FOREST.

Twenty years old, the present stand of black walnut has reached an average diameter at breast height ("D. B. H.") of 8 inches, a height of 45 feet. The success of such investments is today practically assured.

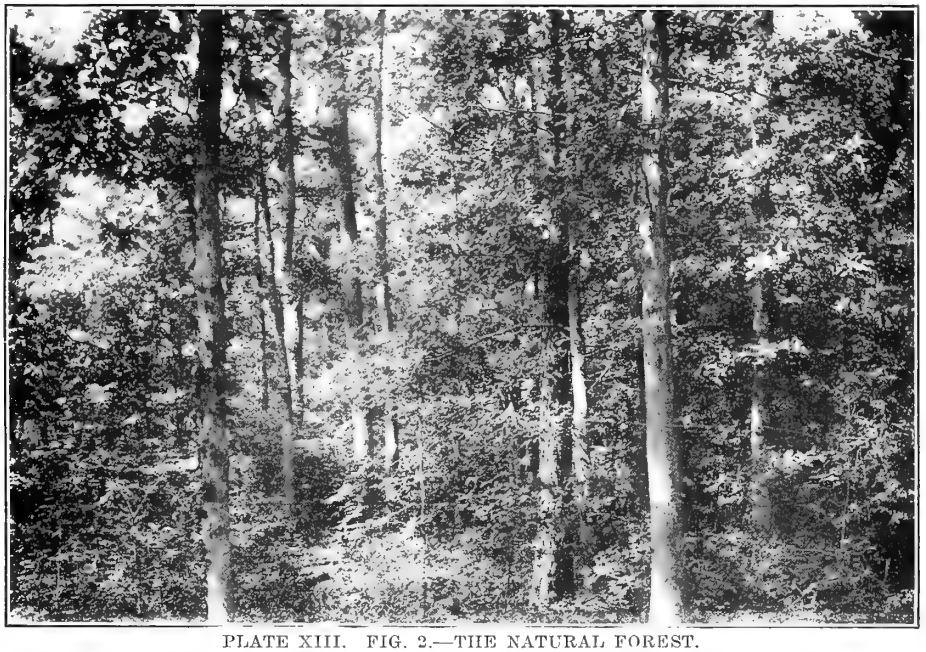


PLATE XIII. FIG. 2.—THE NATURAL FOREST.

Mature trees healthy and well-formed; abundant reproduction; and a stand of the right species, are all indicative of the well-tended, protected woodlot.

under improved management. The fullest degree of production is only possible where existing woodlands are adequately stocked with growing trees, and the maximum yield, quantity and quality may only be obtained by encouragement of the species best adapted to each location, as well as those for which there exists the chief demand. This means elimination of the undesirable species, the weed-trees, and full protection against fires and other destructive agencies.

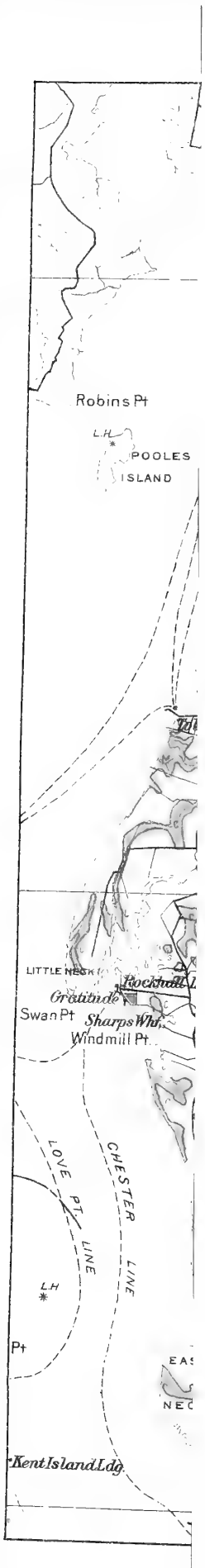
KENT COUNTY.

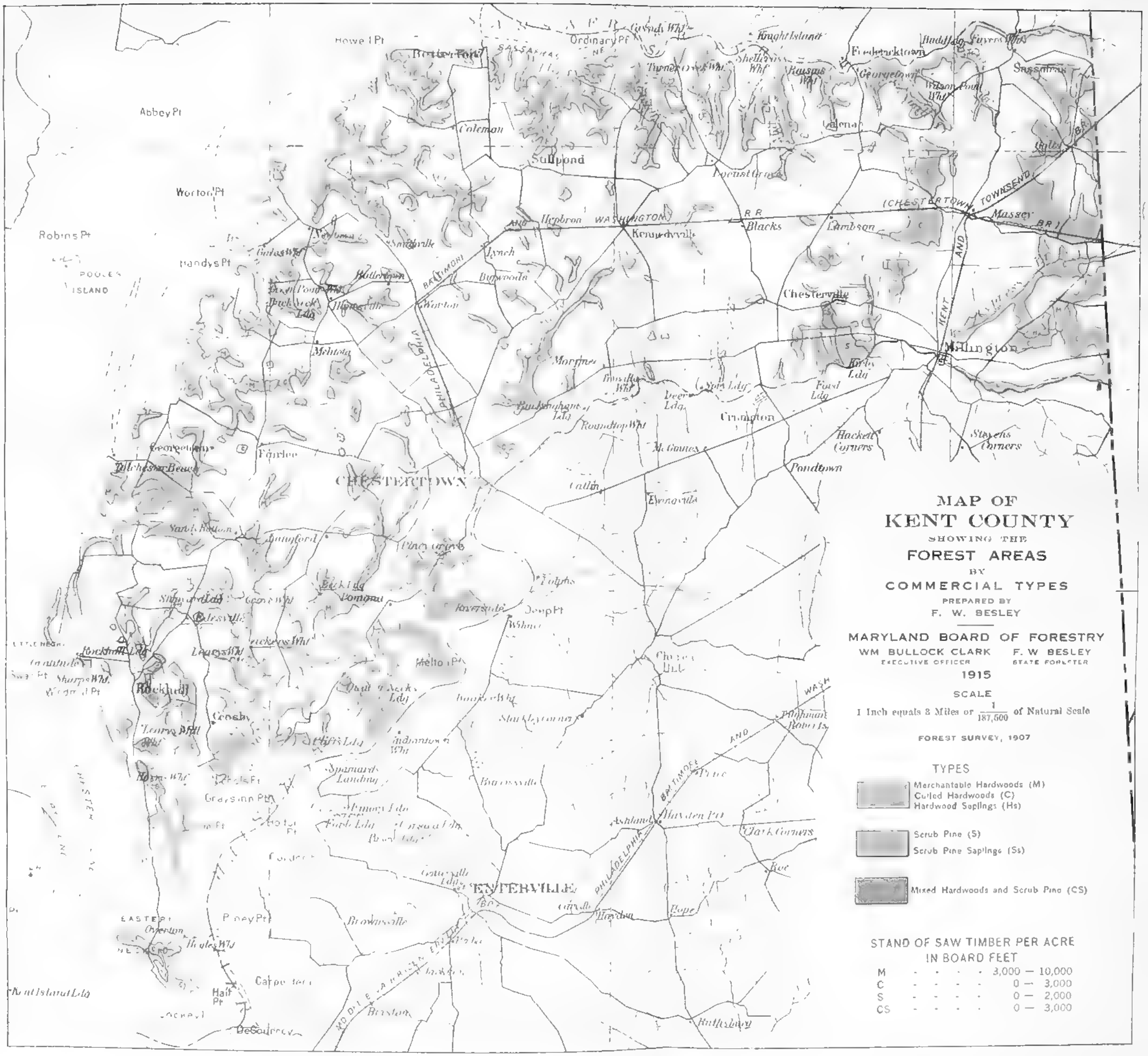
SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	1,210,000 Board Feet	$18.00 per M	$21,780
Softwood	116,000 Board Feet	15.00 per M	1,740
Pulpwood	565 Cords	6.00 per Cord	3,390
Railroad Ties	13,500	.60 each	8,100
Piling	46,800 Lineal Feet	.10 per Foot	4,680
Cordwood	1,080 Cords	3.50 per Cord	3,780
Mine Props	250 Tons	2.25 per Ton	563
Poles	1,080	3.00 each	3,240
Shingles	90,000	4.15 per M	374
Posts	36,000	.15 each	5,400
The County	382,870 Cubic Feet		$53,047

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $
1	43,405	10,404	24	14,119	60	14,179	$70,595	$300	$70,895
2	42,374	4,799	11	9,722	9	9,731	48,610	45	48,655
3	26,419	4,488	17	5,539	.....	5,539	27,695	.....	27,695
4	5,376	609	11	1,311	.....	1,311	6,555	.....	6,555
5	19,059	4,029	21	3,888	90	3,978	19,440	450	19,890
6	23,642	4,834	20	8,826	.....	8,826	44,130	.....	44,130
7	19,597	4,613	24	6,455	.....	6,455	32,275	.....	32,275
The County	179,872	33,776	19	49,860	159	50,019	$249,300	$795	$250,095


Robins Pt
LH
POOLES
ISLAND
LITTLE NECK
Gratitude
Swan Pt
Sharps Wh
Windmill Pt
LOVE PT. LINE
CHESTER LINE
LH
Pt
EAS
NEC
Kent Island Ldg


MAP OF
KENT COUNTY
SHOWING THE
FOREST AREAS
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COMMERCIAL TYPES
PREPARED BY
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MARYLAND BOARD OF FORESTRY
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1 Inch equals 3 Miles or 1/187,500 of Natural Scale
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TYPES
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Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine (S)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M 3,000 — 10,000
C 0 — 3,000
S 0 — 2,000
CS 0 — 3,000
CHESTERTOWN
CENTERVILLE
Howell Pt
Abbey Pt
Worton Pt
Robins Pt
Handys Pt
POOLES ISLAND
Ordinary Pt
Knight Island
Fredericktown
Georgetown
Sassafras
Galena
Coleman
Sullpond
Locust Grove
Hepbron
Kennedyville
Blacks
Lambson
Massey
Chesterville
Millington
Worton
Lynch
Crumpton
Morgnec
Hackett Corners
Stevens Corners
Pondtown
Catlin
Fairlee
Rockhall
Crosby
Graysinn Pt
Piney Pt
Brownsville
Ashland
Hayden
Roberts
Clark Corners
Ruthsburg
DeCourcey
Kent Island Ldg
WASHINGTON
BALTIMORE
PHILADELPHIA
CHESTERTOWN
TOWNSEND
KENT
AND

MONTGOMERY COUNTY.

Montgomery is the southernmost of the Piedmont counties, lying immediately north of the District of Columbia. It is bordered on the south by the Potomac River. The northern and western parts of the county consist of rolling land with a few prominent hills, while the southeastern section, bordering on the Coastal Plain, is very nearly flat. The lowest elevation is adjacent to the Potomac River in the extreme southern section, and only about 50 feet above sea level, while the highest is in the most northern part where an altitude of 800 feet is reached. The principal elevation, however, extends through the central part of the county, from north to south, with a gradual rise to form an elevation which farther north is known as Parr's Ridge. The soils are mainly of sands and clay loam typical of the Piedmont Plateau, becoming almost pure sand in the southeastern section near the Prince George's County line. The forest areas are rather evenly distributed, and there is comparatively little land in the county that is not suitable for tillage, such areas consisting usually of rocky knolls and steeper hillsides, found somewhat scattered all through the county.

The Forests.

Just 22 per cent of Montgomery County is wooded, and the only large areas of woodland found are those near Rockville and to the south, with a few fair-sized tracts of forest around Buck Lodge. Nearly all the forests are of the characteristic mixed hardwood type prevalent all along the Piedmont Plateau. The only areas where pine is abundant are east of Rockville and in the vicinity of Clarksburg. The principal timber species are chestnut, white oak, some of the mixed oaks, tulip poplar and hickory. Chestnut, in mixture with the oaks, is found generally distributed over the county, often occurring in pure stands on the ridges and upper slopes in the northern and northwestern sections of the county. Such stands are usually of coppice growth, and consist principally of small trees which have been less damaged by the blight than in any other part of the Piedmont section. White oak is most abundant in the southern and eastern sections of the county, where it occurs in mixture with black, pin and Spanish oaks, tulip poplar, hickory and chestnut.

Mixed oaks—which include the Spanish, scarlet, pin and red oaks—are generally distributed over the county, but are most abundant in the southern and southeastern sections. Scarlet, post and black oaks occur on the ridges in the poorer and dryer soils, while the pin, red and Spanish oaks are more commonly found on the lower slopes and along the streams, where conditions of soil and moisture are usually more favorable. Tulip poplar occurs in all parts of Montgomery County, but is not present in sufficient quantity to constitute a very important factor. It grows on the deep, moist soils adjacent to ravines and streams, almost invariably in mixture with other species and forming but a small percentage of the whole. Individual trees growing in favorable locations attain large dimensons, but the high value of this species has encouraged its cutting to such an extent that practically none of the original growth is left.

The forests of Montgomery County are 94 per cent hardwood, 4 per cent pine, and 2 per cent mixed hardwood and pine, according to the Forest Survey made of this county in 1910. There are 4,823 acres of the first-named where the stand equals or exceeds 5,000 board feet per acre, and 59,416 acres of hardwoods amounting to less than this; 272 acres of pine amounting to more than 5,000 feet, and 2,806 acres of less; and 1,504 acres of mixed stands, all below 5,000 feet per acre.

USES OF THE FORESTS.

There are 28 large producers of lumber and timber in this county who in 1914 were estimated to have cut and marketed 1,215,545 cubic feet of wood, with a value at the shipping point of $175,422. This is a considerable cut for a county with so small a percentage of forest land, and necessarily exceeds substantially the annual growth. However, it is made possible by the relatively large size of this county's total land area, the seventh in the State in this respect, and it is probable that the present cut may be maintained for several years. In order of amount and value lumber comes first, followed by cordwood, poles, piling, railroad ties, pulpwood, lath, shingles, and tanbark. It will be noted that the cut of cordwood is unusually heavy, and it is probably accounted for in part by the nearby market of Washington, as well as that of Rockville, in the county. As to transportation, 15 miles of trolley lines and 32 of railway furnish ample facilities for marketing the county's forest products. But little manufacturing of wood is conducted, though there are two planing mills and yards at Gaithersburg, with a chair and box manufactory at Washington Grove.

There is a constant decrease in the wooded area of this county, due to the clearing of land, and while this at present is very gradual, it seems likely to continue. There are, on the other hand, a few areas in the southeastern part of the county which, once cleared and cultivated, are now growing up in pine. The small woodlots here are as a rule better cared for than the larger tracts, for the farmer removes only from time to time such material as firewood and a small amount for building purposes, while in tracts of larger size the timber is usually sold outright to sawmill operators, who cut practically everything of value, and leave the remaining woodland in a depleted condition. This practice of culling has been continued for several years, and the quality of existing forests has in consequence manifested steady deterioration.

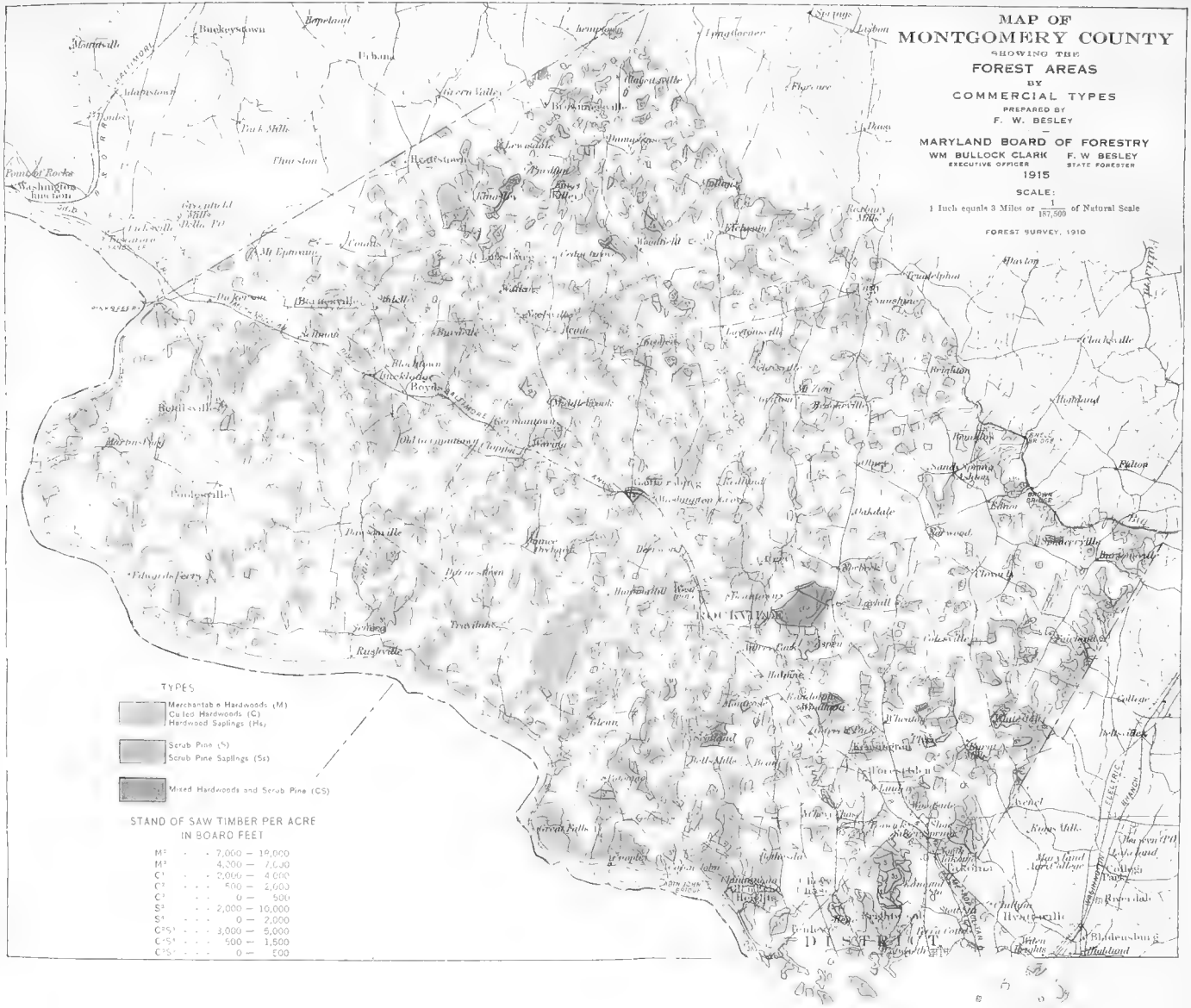
MONTGOMERY COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	4,335,000 Board Feet	$17.00 per M	$73,695
Softwood	3,230,000 Board Feet	14.00 per M	45,220
Pulpwood	680 Cords	6.00 per Cord	4,080
Railroad Ties	11,490	.55 each	6,320
Piling	119,000 Lineal Feet	.10 per Foot	11,900
Cordwood: Oak	2,450 Cords	4.50 per Cord	11,025
Pine	1,175 Cords	3.50 per Cord	4,112
Tan Bark	150 Tons	8.50 per Ton	1,275
Poles	4,340	3.00 each	13,020
Shingles	3,750,000	4.50 per M	1,688
Lath	950,000	3.25 per M	3,087
The County	1,215,545 Cubic Feet		$175,422

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $
1	26,730	5,531	20	13,369	271	13,640	$66,845	$1,355	$68,200
2	22,805	6,394	28	11,217	513	11,730	56,085	2,565	58,650
3	38,821	4,846	12	8,728	31	8,759	43,640	155	43,795
4	22,808	5,165	23	7,424	243	7,667	37,120	1,215	38,335
5	19,675	5,493	28	7,967	136	8,103	39,835	680	40,515
6	26,449	6,370	24	11,984	1,225	13,209	59,920	6,125	66,045
7	6,757	4,143	61	7,907	111	8,018	39,535	555	40,090
8	29,675	4,427	15	14,108	31	14,139	70,540	155	70,695
9	19,950	3,658	18	6,846	241	7,087	34,230	1,205	35,435
10	19,256	6,770	35	13,495	947	14,442	67,475	4,735	72,210
11	23,420	4,533	19	8,060	.....	8,060	40,300	.....	40,300
12	21,785	4,876	23	5,360	61	5,421	26,800	305	27,105
13	23,750	6,618	28	13,875	3,703	17,578	69,375	18,515	87,890
The County	302,881	68,821	22	130,340	7,513	137,853	$651,700	$37,565	$689,265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Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine (S)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M² 7,000 — 12,000
M³ 4,000 — 7,000
C¹ 2,000 — 4,000
C² 500 — 2,000
C³ 0 — 500
S³ 2,000 — 10,000
S⁴ 0 — 2,000
C²S³ 3,000 — 5,000
C¹S⁴ 500 — 1,500
C³S⁵ 0 — 500

PRINCE GEORGE'S COUNTY.

Prince George's County lies in two physiographic divisions, which give it a somewhat varied topography. The highest elevations, about 400 feet above sea level, occur in the northern part, extending southward at a decreasing height through the central portion of the county to form the divide between the Patuxent on the east and the Potomac to the west, where tidewater is reached. Fully five-sixths of the county lies within the so-called Coastal Plain, but as its surface is made up almost entirely of a succession of low hills and narrow valleys, there is little resemblance here to the Coastal Plain section east of the Chesapeake. Along the lower Patuxent River, and a few of the tidal creeks tributary to the Potomac, are to be found narrow strips of fresh water marshes. Drainage, on the whole, is excellent, and conditions generally conducive to a forest growth of both good volume and high quality. The soils vary from light sand to stiff clay, but for the most part they are sandy loams almost equally adapted to forest or farm, except on the steeper slopes, where a forest cover is necessary for keeping the loose soils intact.

The Forests.

The county's present wooded area amounts to 41 per cent, although its earliest history shows an area well covered with forest. The section along the Patuxent River was known at the time of its settlement as "The Forests of Prince George," but since it was the first to be settled it has now the smallest percentage of forest land of any part of the county. Throughout the county the hardwoods were early exploited, being in good demand for saw timber, later for railroad ties, piling, and poles, so that they have now been repeatedly culled, leaving in the original forests open places which have been reseeded by the scrub pine. The first forests were almost universally of the mixed hardwood type, but the process of natural agricultural development has brought about two other types, the pure pine and the hardwood-pine. The pine common to the county will not grow to any appreciable extent under the shade of hardwoods, but it almost invariably comes in after cultivation has been abandoned on lands that were once farmed.

Mixed hardwoods comprise 72 per cent of the total area of woodland; the pure pine type 18 per cent; and the hardwood-pine 10 per cent. On the higher, dryer hills and ridges are commonly found chestnut, scarlet and post oaks; on the lower slopes, hickory, tulip poplar, white, black and Spanish oaks. On the low lands along the watercourses, and the undrained flats which occupy a small percentage of the wooded area, are red maple, willow, black gum, river birch, willow and pin oaks. In the pine stands which occur in the northern, southeastern, and southwestern sections of the county the two species represented are the scrub and pitch pines, the latter occuring only occasionally on sandy soils along the edge of swamps, and seldom in sufficient numbers to constitute a stand. Pine and oak, chiefly white oak, are found in mixture in the northern half of the county. On the 127,200 acres of forest land is a stand of saw timber aggregating 176,627,000 board feet. The Prince George's County Forest Survey, 1907, indicates hardwoods of 5,000 feet or more on 2,122 acres of land, and of less than 5,000 on 89,124 acres; pine stands, all under 5,000 feet, on 23,755 acres; mixtures of both over an acrea of 12,199 acres, all of which is also less than 5,000 board feet per acre.

USES OF THE FORESTS.

The annual cut of lumber, ties, pulpwood, cordwood, staves, piling, poles, mine props, export logs, and posts, to name the different forest products in order of value, totals 1,388,000 cubic feet of wood, for the year 1914, with a value at the 32 mills, or other shipping points, of $161,939. It is therefore manifest that local woodlands contribute largely to the prosperity of the county, and the products of the forest rank next to those of agriculture as an important source of revenue. Although it is probable that the cut of hardwoods has decreased within recent years, it is equally true that the use of the pines, particularly the scrub, has shown a growing demand and a correspondingly heavy cut. The use of scrub pine for pulpwood began in the county about fifteen years ago, and has shown a steady increase since. For staves also the pine has come to be widely used, and to a lesser extent for railroad ties, the latter usually receiving some preservative treatment before use. There are approximately 100 miles of steam and electric lines in this county, all of which help to make most of the timbered regions easily accessible, as well as furnishing excellent markets for some of their forest products. The wood-using industries of this county are restricted to yards at Berwyn, Capitol Heights, Hyattsville, Laurel, Riverdale, and Upper Marlboro, with planing

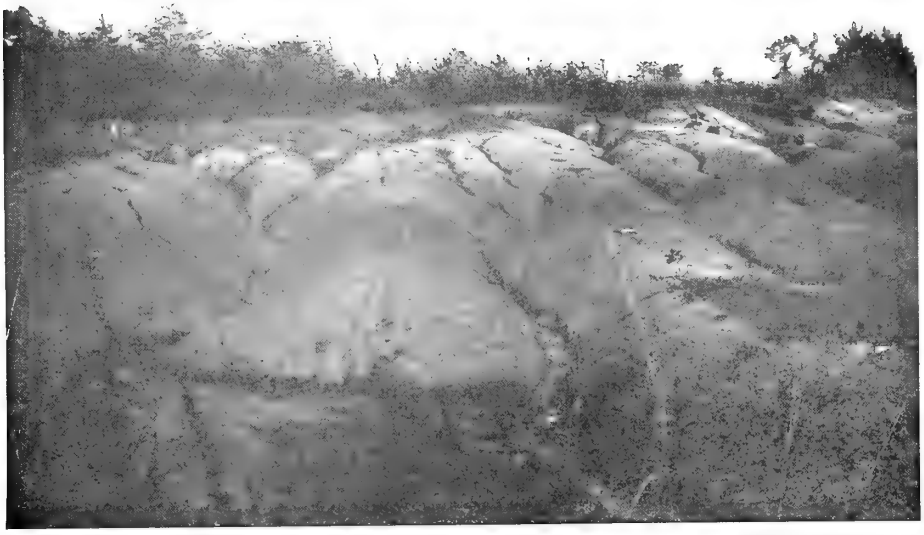


PLATE XIV. FIG. 1.—ERODED LANDS IN SOUTHERN MARYLAND.

Destructive erosion is usually the consequence of cutting forests from rolling lands which should remain in timber growth. This abuse of the land is not confined to a single section of the State.

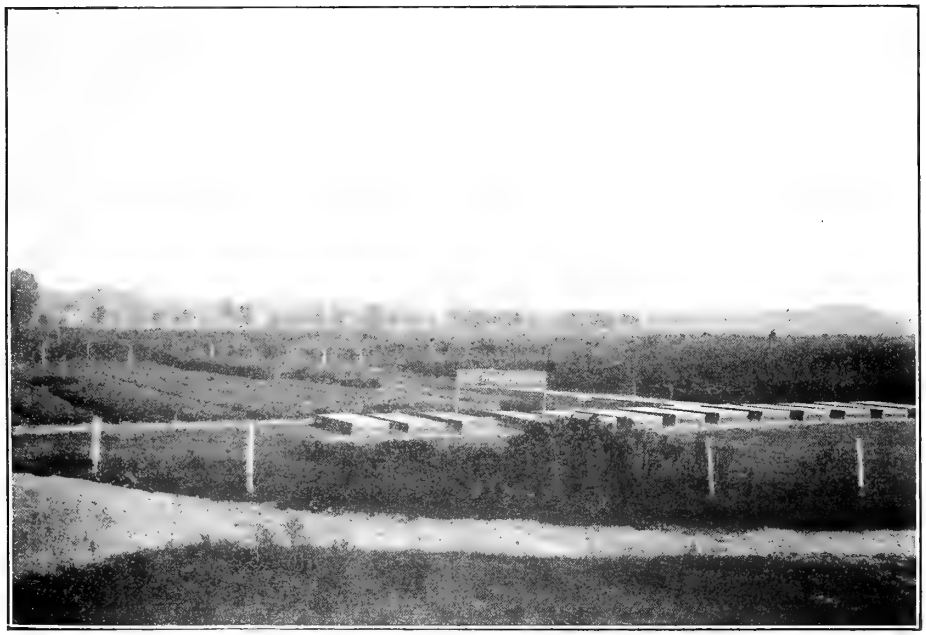


PLATE XIV. FIG. 2.—THE STATE FOREST NURSERY.

Supplied with thousands of growing trees in the species best adapted to this State, the Forest Nursery, College Park, is the State's answer to the often expressed need of suitable stock for forest planting.

mills at Berwyn and Riverdale, all concerns depending upon the retail trade of their respective sections.

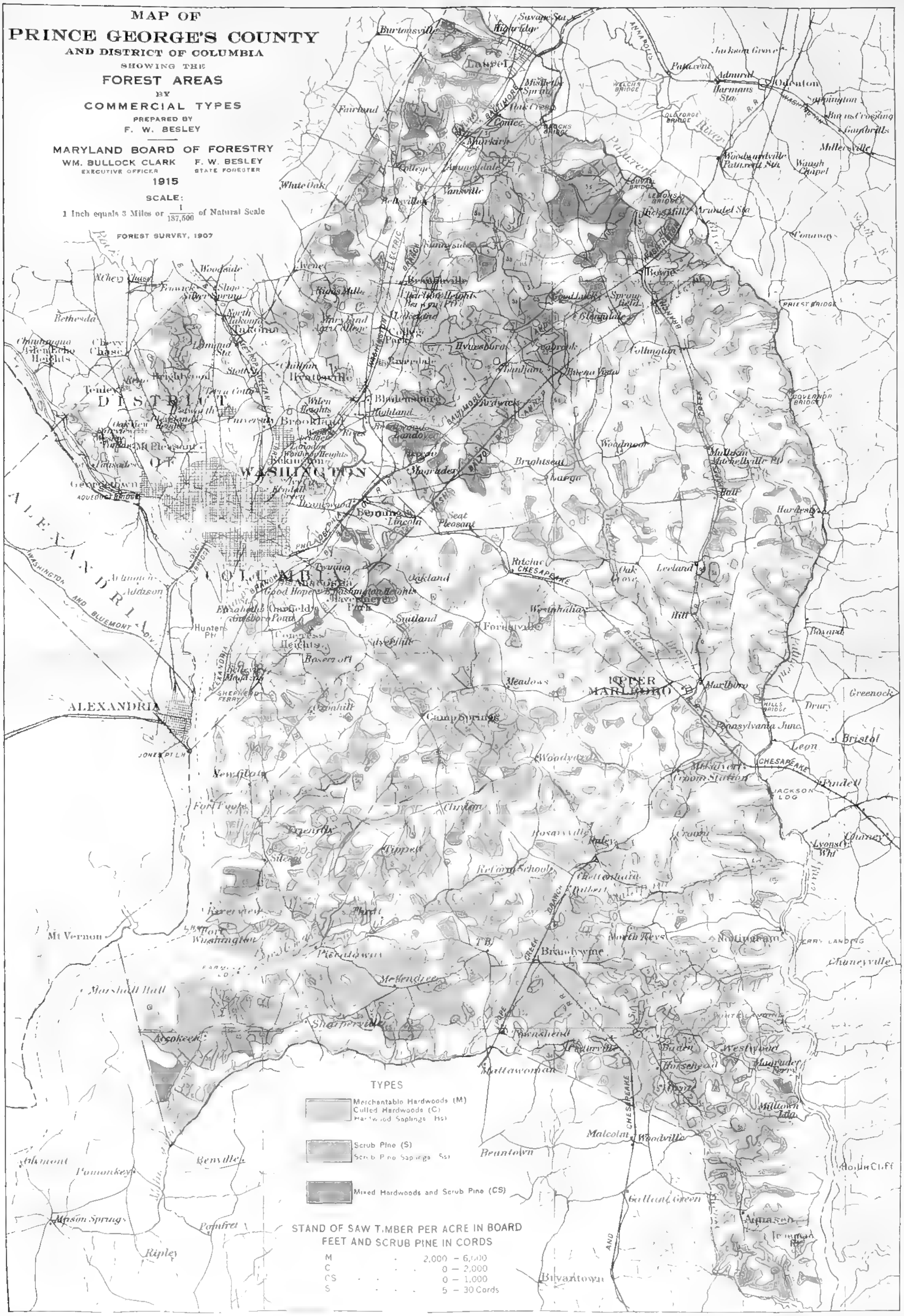
The forests of Prince George's County, like those of others in the State, are readily susceptible to improved methods, and respond readily to forest management of the right sort. Where the forests have been abused by excessive and injurious cutting, and perhaps injured repeatedly by fires, the first consideration must be to get them as fully stocked as possible. This may often be accomplished by natural seeding where the woodland is efficiently protected from fire, and excessive grazing prevented. Where the present stand consists only of scattered trees of undesirable kinds, and there are not a sufficient number of seed trees of the better species to restock the land effectually, it is advisable that the land be cut clean, and replanted with an adequate number of some more useful trees.

PRINCE GEORGE'S COUNTY.
SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	2,457,000 Board Feet	$17.00 per M	$41,769
Softwood	810,000 Board Feet	14.00 per M	11,340
Pulpwood: Poplar	450 Cords	6.50 per Cord	2,925
Gum	450 Cords	6.50 per Cord	2,925
Pine	2,700 Cords	4.50 per Cord	12,150
Railroad Ties:			
White Oak	31,500	.70 each	22,050
Mixed Oak	63,000	.50 each	31,500
Chestnut	12,600	.20 each	2,520
Pine	900	.30 each	270
Piling	52,000 Lineal Feet	.11 per Foot	5,720
Cordwood: Oak	1,200 Cords	5.00 per Cord	6,000
Pine	2,400 Cords	4.00 per Cord	9,600
Mine Props	480 Tons	2.25 per Ton	1,080
Staves	855,000 Pieces	7.50 per M	6,412
Poles	900	3.50 each	3,150
Shingles	180,000	4.50 per M	810
Posts: Cedar	2,700	.20 each	540
Chestnut	900	.12 each	108
Export Logs:			
Walnut	13,000 Board Feet	50.00 per M	650
Poplar	14,000 Board Feet	30.00 per M	420
The County	1,388,000 Cubic Feet		$161,939

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $4.00 per M.	Total $
1	23,083	12,492	54	5,845	11,705	17,550	$23,380	$46,820	$70,200
2	8,806	4,481	51	2,444	5,721	8,165	9,776	22,884	32,660
3	15,360	4,134	27	5,265	.....	5,265	21,060	.....	21,060
4	24,678	7,272	29	10,106	1,082	11,188	40,424	4,328	44,752
5	31,149	17,127	58	13,052	14,213	27,265	52,208	56,852	109,060
6	14,605	6,199	42	4,397	800	5,197	17,588	3,200	20,788
7	29,581	6,723	23	9,864	104	9,968	39,456	416	39,872
8	19,866	9,448	48	7,883	5,723	13,606	31,532	22,892	54,424
9	17,683	8,329	47	6,341	3,738	10,079	25,364	14,952	40,316
10	7,885	2,982	38	2,034	877	2,911	8,136	3,508	11,644
11	28,595	16,833	59	13,368	5,080	18,448	53,472	20,320	73,792
12	12,122	3,736	31	3,688	701	4,389	14,752	2,804	17,556
13	21,645	7,389	34	6,180	6,532	12,712	24,720	26,128	50,848
14	24,742	13,987	57	9,675	10,399	20,074	38,700	41,596	80,296
15	19,571	3,986	20	5,180	381	5,561	20,720	1,524	22,244
16	7,501	2,082	28	2,522	1,727	4,249	10,088	6,908	16,996
The County	306,872	127,200	41	107,844	68,783	176,627	$431,376	$275,132	$706,508


MAP OF
PRINCE GEORGE'S COUNTY
AND DISTRICT OF COLUMBIA
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1907
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Scrub Pine (S)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET AND SCRUB PINE IN CORDS
M 2,000 – 6,000
C 0 – 2,000
CS 0 – 1,000
S 5 – 30 Cords
WASHINGTON
DISTRICT OF COLUMBIA
ALEXANDRIA
UPPER MARLBORO
Laurel
Bowie
Brandywine

QUEEN ANNE'S COUNTY.

Queen Anne's County lies on the eastern shore of Chesapeake Bay; it is south of the Chester River, its principal inland waterway; and borders Delaware on the east. The main topographical features are flat to gently rolling lands which vary in altitude from 10 feet along the tidal rivers to about 100 feet in the east-central part of the county. There is a slight elevation extending through the central part, dividing the drainage of the Chester and Tuckahoe Rivers, while the whole surface is broken up by numerous small streams and sluggish creeks. The predominating soil of the higher portion is a rich Sassafras loam, with small areas of sandy soils along the Chester River. Queen Anne's is distinctly an agricultural county, with a considerable amount of forest land which will eventually be utilized for cultivated crops.

The Forests.

In this county occurs the southern extension of the pure hardwood forests so characteristic of central Maryland, with the addition of some new species and a considerable difference in their relative representation. With the exception of Kent Island, upon which the forests are principally loblolly pine, the softwood areas are small and mostly of the scrub pine type. In all, 26 per cent of the county is in woodland, generally in small, irregular patches, though in a few cases several hundred acres in extent.

One of the chief differences of the forests of this county from those farther north is the small percentage of chestnut found, as it here reaches practically its southern limit of distribution on the Eastern Shore peninsula. There are few swampy areas, the only ones of any extent occurring in the northeastern part of the county, where the prevailing swamp hardwoods—red maple, red and black gums, and other species in smaller proportion—are found. The principal timber trees of the county are white, black, Spanish, willow, pin and red oaks, red maple, red gum, black gum, and hickory. As elsewhere, the white, red and black oaks are found on the better-drained soils, and furnish the great bulk of the timber cut in the county; while the other species occur on the poorer soils, and are only taken for timber when more desirable kinds are not available.

Hardwood forests constitute 94 per cent of the county's total wooded area, the survey of 1909 shows, stands of pine, and of mixed hardwood and pine, each being present to the extent of only 3 per cent. None of the hardwoods amount to over 5,000 board feet per acre, while there are 55,359 acres where the stand is less than this; 166 acres of pine contains stands of 5,000 and more board feet per acre, and 1,840 acres of less; there are only 31 acres of mixed stands exceeding 5,000 feet, and 1,874 of less.

USES OF THE FORESTS.

The 1914 cut in Queen Anne's County from 26 mills and large timber operators aggregated 690,205 cubic feet, with a value of $83,363. Lumber is of course heading the list, with the other forest products, in order of their importance, cordwood, piling, poles, pulpwood, railroad ties, mine props, and lath. There are 54 miles of railroad lines in Queen Anne's County, with the extensive frontage of navigable water providing adequate facilities for developing and marketing the forest resources. Wood-using industries are relatively unimportant, there being practically no manufacturing of wood carried on except for a planing mill at Queen Anne, and a mill and yard at Chester. There are in addition retail yards at Centreville, Church Hill, and Sudlersville.

By efficient fire protection and the practice of intensive forest management the forests, already favored by uniformly fertile soils, may easily be made one of the county's most important assets. They are at present, however, poorly managed or neglected, due in large part to the fact that about three-fourths of the farms are leased to tenants, with certain unrestricted wood rights which are clearly inimical to the better sort of forest management.

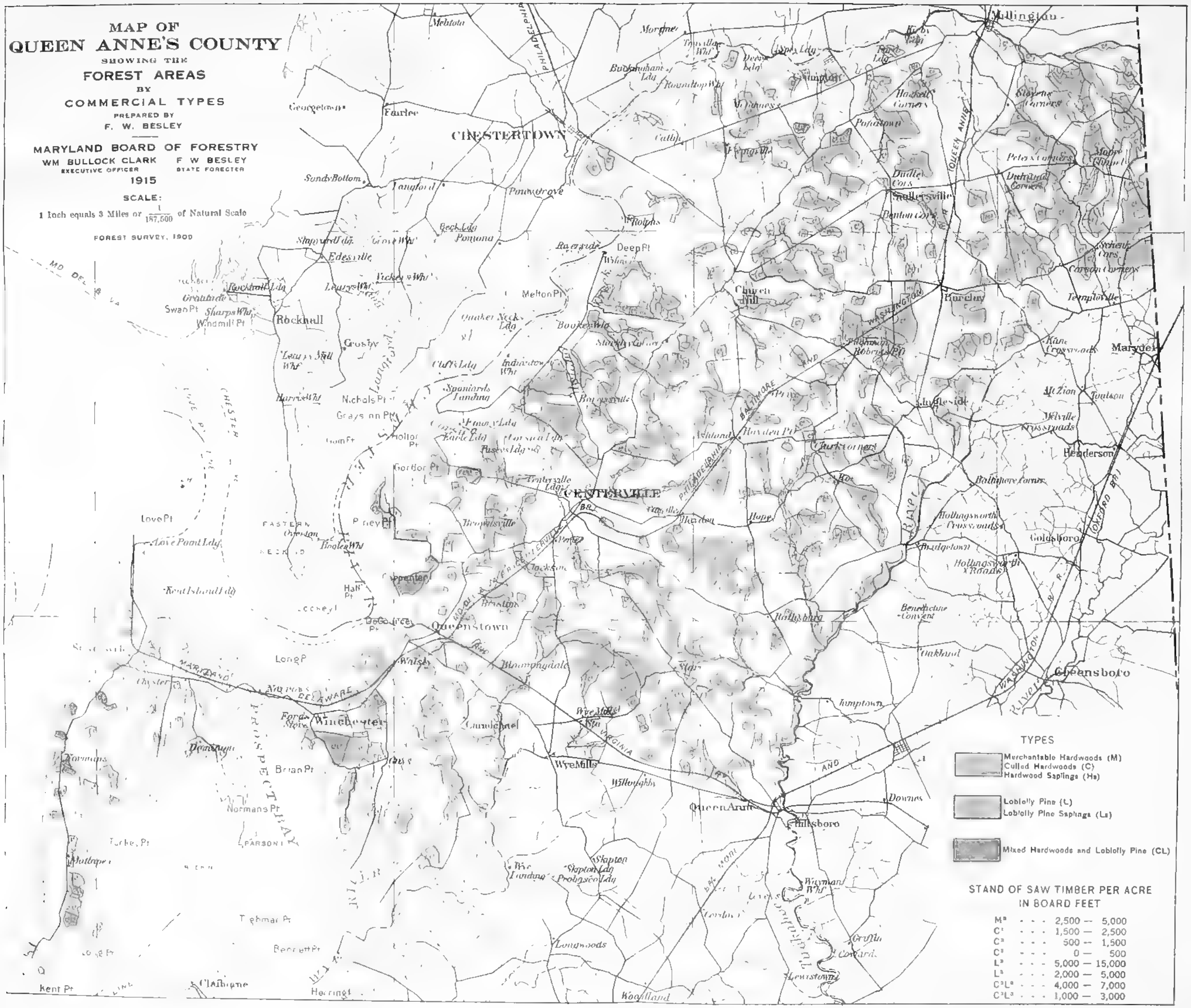
QUEEN ANNE'S COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	2,400,000 Board Feet	$18.00 per M	$43,200
Softwood	1,380,000 Board Feet	15.00 per M	20,700
Pulpwood	350 Cords	5.50 per Cord	1,925
Railroad Ties	1,800	.50 each	900
Piling	33,000 Lineal Feet	.10 per Foot	3,300
Cordwood	3,400 Cords	3.00 per Cord	10,200
Mine Props	270 Tons	2.25 per Ton	608
Poles	800	3.00 each	2,400
Lath	40,000	3.25 per M	130
The County	690,205 Cubic Feet		$83,363

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.50 per M.	Pine $5.00 per M.	Total $
1	46,338	15,992	35	16,337	.....	16,337	$73,516	.....	$73,516
2	32,881	6,722	24	8,261	131	8,392	37,175	$655	37,830
3	46,861	13,134	28	16,130	874	17,004	72,585	4,370	76,955
4	11,017	2,522	23	572	6,397	6,969	2,514	31,985	34,559
5	34,830	6,731	14	8,050	5,709	13,759	36,225	28,545	64,770
6	36,430	9,349	26	12,318	3	12,321	55,431	15	55,446
7	23,353	4,820	26	3,891	1,427	5,318	17,509	7,135	24,644
The County	231,770	59,270	26	65,559	14,541	80,100	$295,015	$72,705	$367,720


MAP OF
QUEEN ANNE'S COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
EXECUTIVE OFFICER
F W BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or $\frac{1}{187,500}$ of Natural Scale
FOREST SURVEY, 1909
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Loblolly Pine Saplings (Ls)
Mixed Hardwoods and Loblolly Pine (CL)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
M^2 - - - 2,500 — 5,000
C^1 - - - 1,500 — 2,500
C^2 - - - 500 — 1,500
C^3 - - - 0 — 500
L^2 - - - 5,000 — 15,000
L^3 - - - 2,000 — 5,000
C^2L^2 - - - 4,000 — 7,000
C^3L^3 - - - 1,000 — 3,000
CHESTERTOWN
CENTERVILLE
Queenstown
Millington
Sudlersville
Church Hill
Barclay
Marydel
Henderson
Goldsboro
Greensboro
Hillsboro
Queen Anne
Wye Mills
Winchester
Rockhall
Edesville
Crosby
Langford
Georgetown
Fairlee
Claiborne
Kent Pt

ST. MARY'S COUNTY.

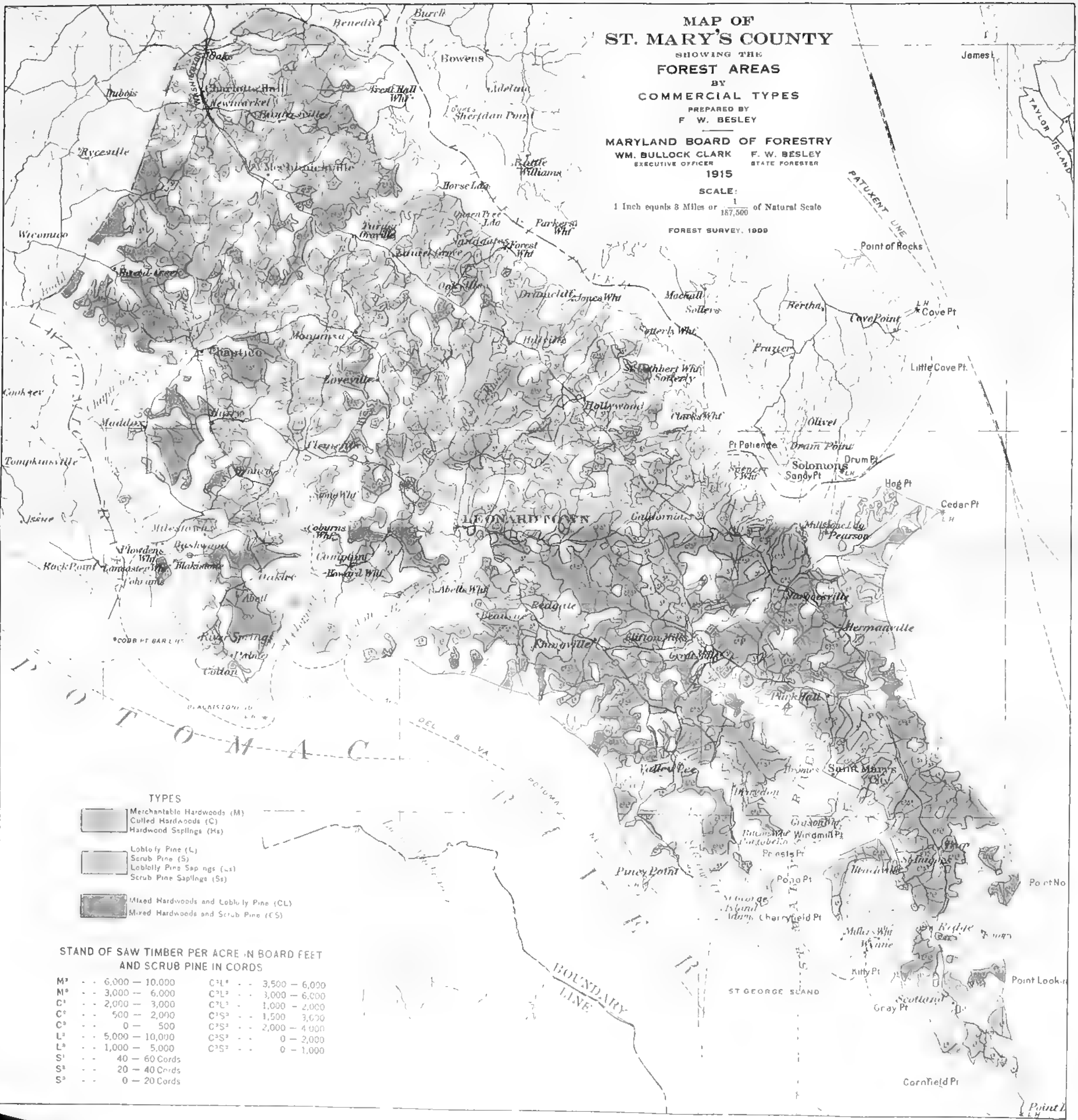
St. Mary's is the southernmost of the group of counties lying on the western shore of Chesapeake Bay and known as southern Maryland. It is bordered on the east by the Patuxent River and Chesapeake Bay, and on the south by the Potomac. The St. Mary's River, at the head of which the first settlement was made in Maryland in 1634, forms the county's principal inland water course. The main topographic feature is a low plateau extending from Point Lookout, at the most southern end of the county, in a northeasterly direction to the Charles County line, a distance of 42 miles and the extreme length of the county. Along this plateau the highest elevations are about 200 feet, the slope from this ridge being eastward toward the Patuxent, and southwest, at tidewater, to the Potomac.

This central plateau was called "The Forest" in early days, since it was almost entirely wooded, with the settlements and cleared areas largely confined to the shores of the Patuxent, Potomac, and their tributaries. As the settlements advanced inland, the section known as "The Forest" gradually lost its first significance, and the wooded areas become interspersed generally with cultivated land, so that at the present forest and farm land are almost equally divided, the only principal exception being adjacent to some of the streams, where there is a larger amount of cleared than forest land.

The Forests.

The present wooded area of St. Mary's County amounts to 51 per cent, a very large amount, and one that is only exceeded by three others in the State. Fifty years ago, however, there was much more land under cultivation than today. The original forests were almost entirely of hardwood, but the abandonment of so much farm land at the close of the Civil War has gradually changed conditions in this county, accounting in marked degree for the larger proportion of pine in the present forests.

The southeastern half of the county has the largest amounts of pine, because it was in this section that so much of the former farm land was permitted to grow up again in forest, and the prolific, light-seeded pine was the species to take possession of the abandoned clearings. The forests of the county may be divided into three types—


MAP OF
ST. MARY'S COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM. BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE:
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1909
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Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Scrub Pine (S)
Loblolly Pine Saplings (Ls)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET AND SCRUB PINE IN CORDS
M¹ - - 6,000 — 10,000
M² - - 3,000 — 6,000
C¹ - - 2,000 — 3,000
C² - - 500 — 2,000
C³ - - 0 — 500
L¹ - - 5,000 — 10,000
L² - - 1,000 — 5,000
S¹ - - 40 — 60 Cords
S² - - 20 — 40 Cords
S³ - - 0 — 20 Cords
C¹L¹ - - 3,500 — 6,000
C²L² - - 3,000 — 6,000
C³L³ - - 1,000 — 2,000
C¹S¹ - - 1,500 — 3,000
C²S² - - 2,000 — 4,000
C²S³ - - 0 — 2,000
C³S³ - - 0 — 1,000
POTOMAC
PATUXENT LINE
TAYLOR ISLAND
BOUNDARY LINE
LEONARDTOWN
Benedict
Burch
Bowens
Oaks
Charlotte Hall
Newmarket
Dubois
Rycesville
Mechanicsville
Horse Ldg
Parkers Whf
Forest Whf
Wicomico
Chaptico
Loveville
Maddox
Tompkinsville
Issue
Hollywood
Clarks Whf
Solomons
Drum Pt
Sandy Pt
Hog Pt
Cedar Pt
Point of Rocks
Cove Pt
Little Cove Pt.
Olivet
Bertha
Cove Point
Pearson
Jarboesville
Hermanville
Park Hall
Saint Mary's City
Piney Point
Windmill Pt
Priests Pt
Cherryfield Pt
St George Island
Kitty Pt
Gray Pt
Cornfield Pt
Point Lookout
Point No
Rock Point
Milestown
Blakistone
Abell
River Springs
Colton
Compton
Chaptico
Ridge
Scotland
James

SOMERSET COUNTY.

Somerset, the southernmost county of Maryland, lies at the lower part of the Eastern Shore peninsula, and directly on Chesapeake Bay, with several tidal rivers—among them the Manokin, Annemessex and Marumsco—cutting deeply into it, and the Wicomico and Pocomoke Rivers touching its northern and southern ends, respectively. There is little variety of topography, and the entire county is very characteristic of the Coastal Plain Division, of which it forms a part. In the northeast section, which has the highest elevations of any portion of the county, the soil is light and sandy; in the southern and western sections there are large marshy areas along the tidal bays and streams. In general, the central and eastern parts of the county contain the best farm soils, which are usually of a loam type. In the southwest a large proportion of the lands are too wet to admit of cultivation without first clearing them of forest, an operation nearly always difficult because of the low elevations which prevail. One-third of the county is less than 10 feet above sea level, and the percentage of marsh land is increasing steadily. Somerset, it may be added, has the highest percentage of waste farm land of any county in the State, and next to the highest in salt marsh.

The Forests.

With the exception of the marshes, the entire county was originally in forest, and it is supposed that this first stand consisted principally of hardwoods. The gradual effect of settlement has been to reduce materially the wooded acreage. As the original areas were cut down, the population at the same time increased, and caused an even greater drain upon the forests which were left. Many of the larger areas have of course been completely deforested, and at the present time only 25 per cent remains in woodland. Present forests are pretty commonly confined to fresh-water swamp lands and poorly drained soils in general, in such situations often occurring in large bodies two to three thousand acres in extent. Such forests as remain are rather evenly divided in their distribution, mixtures of softwoods and hard occurring in all parts of the county, as well as pure stands of pine and of mixed hardwoods, although in the extreme northeastern section the sandy soils have caused a corresponding preponderance of pine.

In the west section of the county loblolly pine is invariably the only tree that can withstand conditions along the borders of the prevailing swamps; and in the gradual sinking of the shore line, and the encroaching of the marshes upon the dryer lands inside, this tree is the last to recede. Over the entire county there is a large amount of loblolly occurring wherever surface conditions are not too wet, and even in such areas this tree will be found growing on the hummocks with scattered hardwoods. In the northern third of the county where hardwoods commonly occur they are usually of a swamp type, consisting principally of scrubby oak and gum, while in the southern section — particularly, though, in the southwest — the white oak is more common, attaining a fair size and good quality. Red gum is also more abundant in the southern section of the county, where it is of noticeably better quality than in the northern part. Loblolly pine reaches its best development on the low, sandy loams in the southern half of Somerset, almost invariably growing in even-aged stands above a lower story of oaks and gum. The demand for oak, particularly white oak, has been heavy, stripping the hardwood stands of their most valuable timber. After a clear cut, pine is the first to reseed, but heavily cut-over stands of hardwood are usually restocked with such relatively inferior species as black gum and red maple. Generally, however, the hardwood forests have suffered more than the pine stands, which, by reason of their consisting of a single species, and that of a kind possessing in marked degree powers of recuperation, have quickly recovered from the cuttings and naturally regenerated the land.

Only 10 per cent of the forested area of Somerset county was in pure hardwoods when the survey of 1910 was made, with 42 per cent in pine (including a small amount of cypress) and 48 per cent in stands of both. Of this, the mixed hardwoods, 7,101 acres in extent, are all of less than 5,000 feet per acre; 7,896 acres of pure pine stands contain timber amounting to 5,000 feet or over to the acre, and 20,843 acres of less; while stands of mixed hardwood and pine contain 5,601 and 26,946 acres, respectively, according to this classification.

USES OF THE FORESTS.

Though the percentage of forest land in Somerset County is not large, there is a relatively heavy cut of lumber and other forest products, which in 1914 amounted to 2,742,423 cubic feet, with a value of $363,174 at shipping points. These figures represent the combined cuts of 46 mill and timber operators, and lumber heads the list in point of amount and value. Mine props are second, then barrel staves,

PLATE XV. FIG. 1.—LOGGING IN SOUTHERN MARYLAND.

Methods like these are well adapted to local conditions, which are often difficult for woods work.

PLATE XV. FIG. 2.—PULPWOOD FOR SHIPMENT.

Disregarded for many years as having little value, the scrub pine forests of Southern Maryland are proving a growing source of revenue in counties where stands of this sort make up a large bulk of the forest area.

cordwood, barrel heads, piling, lath, railroad ties, and shingles. Somerset has a cut of softwood or pine lumber only exceeded by that of four other counties — Dorchester, Garrett, Wicomico, and Worcester; in mine props it heads the State. A large water frontage is responsible for a considerable cut of piling, and there is a somewhat limited market for cordwood, the greater part of which is pine. There are in all 35 miles of railway in this county, and the facilities for water shipping are unusual. Planing mills are located at Crisfield, Harold, and Princess Anne; plants for box and crate making at Crisfield, Harold, Princess Anne, and Westover; for barrels at Marion Station; boats at Crisfield; and a total of six yards at Crisfield, Harold, Marion Station, and Princess Anne. It would seem, with the timber supply at hand and the shipping facilities nearly everywhere available, that this branch of forest products might warrant some extension. There is about $125,000 invested in the timber business, which employs 400 men. Such industries are of incalculable benefit to any county, and right management of local forest resources should make possible a continuance of these conditions, if not an actual improvement in them.

Fortunately, there has come about in the last few years a decided change for the better in the attitude of landowners toward forests. When wood was very abundant, and consequently cheap, little attention was ever given to the growing of this crop. Now, with the great increase in general timber values, more attention is being paid to the management of woodlands. There is also being experienced generally a very rapid rise in the values of farm land, and this also has resulted in more intensive farm management, with a consequent favorable reaction toward improved conditions in the woodlot. Of the farms of the county, 25 per cent are operated by tenants, and this farming under lease has always been an obstacle to the best kind of forest management. The tenant cannot, of course, be expected to manifest toward the wooded portions of the farm exactly the same attitude as the owner. And since while upon the farm he is in practically complete control, it is difficult for the actual landowner to carry out any well-regulated system of forest management, even were he disposed to do so. In the past the average landowner has not always been appreciative of the actual value of forest lands as a source of income, and this has resulted in their sometimes being managed at much less than their maximum of output. With the increase of values and changed conditions along these lines, it is anticipated that better forest management will in time receive the necessary impetus in Somerset County.

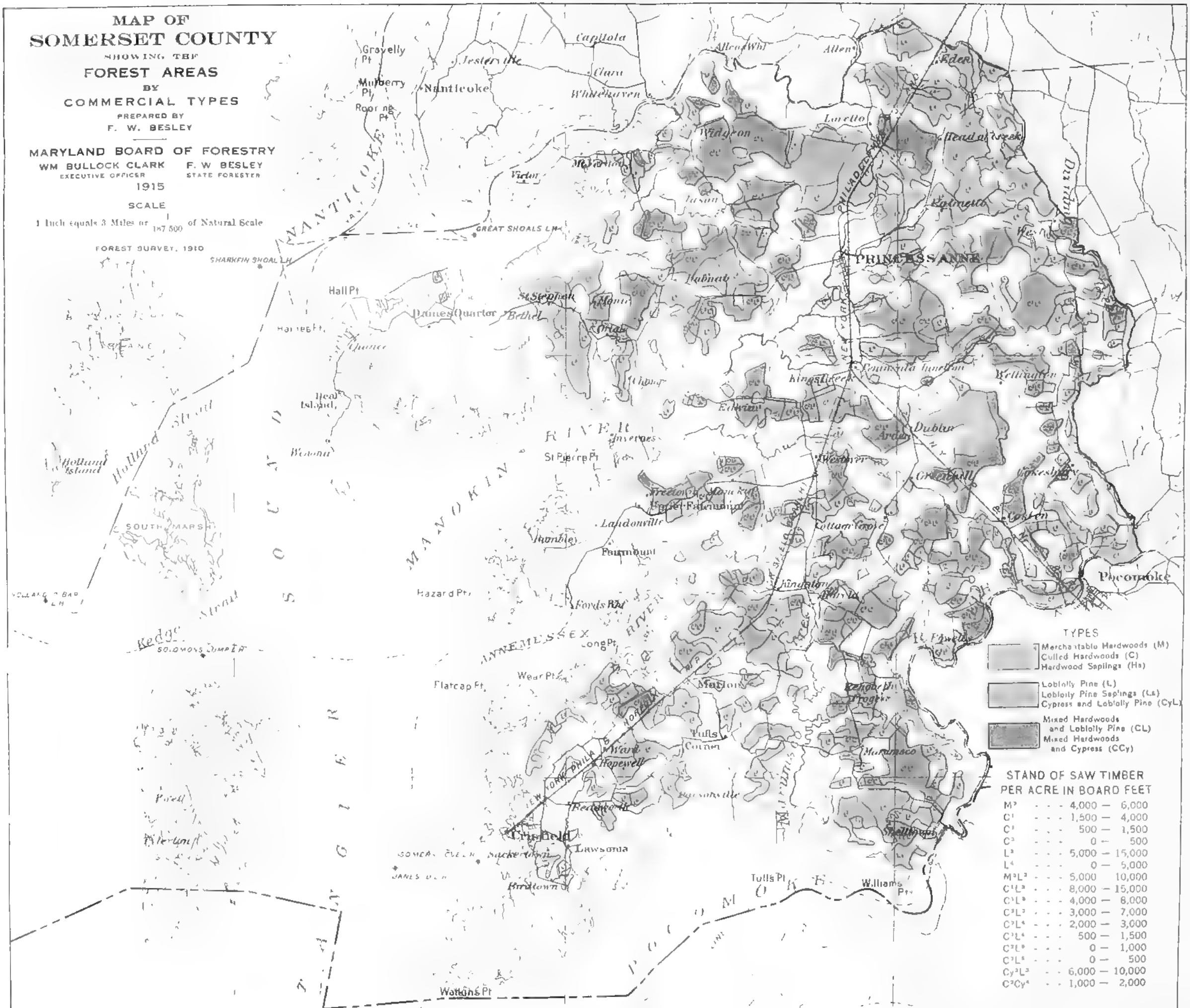
SOMERSET COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	2,515,000 Board Feet	$18.00 per M	$45,270
Softwood	11,625,000 Board Feet	16.00 per M	186,000
Railroad Ties	600	.50 each	300
Piling	32,500 Lineal Feet	.10 per Foot	3,250
Cordwood: Oak	565 Cords	3.50 per Cord	1,978
Pine	735 Cords	2.50 per Cord	1,837
Mine Props	41,470 Tons	2.25 per Ton	93,487
Staves and Headings	3,745,000 Pieces	7.82+ per M	29,299
Shingles	30,000	4.25 per M	128
Lath	500,000	3.25 per M	1,625
The County	2,742,423 Cubic Feet		$363,174

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	22,430	14,751	66	5,633	23,683	29,316	$22,532	$118,415	$140,947
2	11,390	3,805	33	250	7,880	8,130	1,000	39,400	40,400
3	64,600	11,451	17	2,950	35,248	38,198	11,800	176,240	188,040
4	53,350	11,792	22	3,950	32,059	36,009	15,800	160,295	176,095
5	11,970	3,402	29	1,726	6,752	8,478	6,904	33,760	40,664
6	7,660	1,252	16	143	2,022	2,165	572	10,110	10,682
7	2,030	41	20	.....	102	102	.....	510	510
8	16,310	3,279	20	133	13,480	13,613	532	.....	532
9	4,160	19	.....	.....	47	47	.....	235	235
10	7,530	.....	.....	.....	.....	.....	.....	.....	.....
11	7,530	72	1	.....	70	70	.....	350	350
12	19,570	392	20	.....	960	960	.....	4,800	4,800
13	2,510	5,458	22	3,386	7,884	11,270	13,544	39,420	52,964
14	28,230	22	.....	.....	55	55	.....	275	275
15	13,910	12,651	91	1,187	2,499	25,686	4,748	122,495	127,243
The County	273,180	68,387	25	19,358	154,741	174,099	$77,432	$706,305	$783,737


MAP OF
SOMERSET COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
EXECUTIVE OFFICER
F. W. BESLEY
STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187 500 of Natural Scale
FOREST SURVEY, 1910
PRINCESS ANNE
Pocomoke
Crisfield
Deal Island
Holland Island
Nanticoke
Manokin River
Annemessex River
Pocomoke River
Tangier Sound
Kedge Strait
Holland Strait
South Marsh
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Loblolly Pine Saplings (Ls)
Cypress and Loblolly Pine (CyL)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Cypress (CCy)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M² - - - 4,000 — 6,000
C¹ - - - 1,500 — 4,000
C² - - - 500 — 1,500
C³ - - - 0 — 500
L³ - - - 5,000 — 15,000
L⁴ - - - 0 — 5,000
M²L³ - - - 5,000 10,000
C¹L³ - - - 8,000 — 15,000
C¹L⁴ - - - 4,000 — 8,000
C²L³ - - - 3,000 — 7,000
C²L⁴ - - - 2,000 — 3,000
C³L⁴ - - - 500 — 1,500
C²L⁵ - - - 0 — 1,000
C³L⁵ - - - 0 — 500
Cy²L³ - - 6,000 — 10,000
C²Cy⁴ - - 1,000 — 2,000

TALBOT COUNTY.

Talbot lies mid-way of the Eastern Shore peninsula, and directly on the Cheasapeake Bay. Two tide-water streams, the Miles and Tred Avon Rivers, extend for some distance into the county, and on the north and south respectively are the Wye and Choptank Rivers, also tide-water streams. These streams are the county's most distinctive topographic feature, dividing the land surface of fully two-thirds of the whole into a series of necks and peninsulas. The numerous water-courses, in addition to the unsurpassed means of transportation which they afford, constitute one of this region's chief charms, and have brought hundreds of people into the county to settle on river-front farms. Local soils vary somewhat in different portions of the county, though for the greater part they are either a silt loam or a light, sand loam, the former occurring particularly in the western section.

The Forests.

Of Talbot's total land area, 29 per cent is wooded. These forests are rather evenly distributed, and frequently large areas of 500 acres or more occur, although such tracts consist usually of a number of woodlots contained in several neighboring farms. A forest map of Talbot County shows rather more hardwoods in the northern part than pine, while from the central portion south this proportion is reversed. However, there is much more pine than any other species, and nearly all of it is loblolly. In most cases the pine is growing in mixture with some of the hardwoods — of which the oaks, red and black gums, red maple and hickory are the most important. Good soil and generally excellent conditions of drainage combine to produce high-quality timber, with perhaps more favorable conditions for its growth than in any other county of the Eastern Shore. Much of this land now in forest, however, is so eminently well suited for agriculture that a considerable percentage of it will no doubt be cleared eventually for cultivation. In fact, clearing is now quite extensively in progress in the southern and northeastern sections of the county.

Considered as a whole, 19 per cent of Talbot County is in mixed hardwood stands; 26 per cent in pine; 55 per cent in mixed hardwood and pine. Some of this, particularly the pine, is in heavy stands: the Forest Survey, made 1910, showing 441 acres of hardwoods amount-

ing to 5,000 board feet or more per acre, and 8,251 acres of less; 6,942 acres of pine of more than 5,000 feet per acre, with only 5,185 acres where the stand is less; and 1,573 acres of mixed hardwoods and pine standing in excess of 5,000 feet per acre, with 23,430 acres of less.

USES OF THE FORESTS.

There are 38 mill and timber operators in Talbot County, this number in 1914 producing a cut of 1,274,994 cubic feet, with a value of $137,212. The cut of lumber takes first place, cordwood next, then staves, poles, pulpwood, railroad ties, lath, shingles, and posts. Aside from the cut of lumber and cordwood, for which there exist good markets, both in the county and farther up the Bay, the minor forest products are not of much importance here. The best of the tie material has probably already been removed, but the cut of pulpwood is scarcely more than commencing. Some manufacturing of wood is conducted in this county, wood-using industries being largely centered at Easton, although three other places are represented. There are retail yards at Easton, Oxford, Trappe, and St. Michael's; boat yards at Oxford; planing mills at Oxford, Tunis Mills and Easton, as well as a plant at Easton for the manufacture of furniture. There are 43 miles of railroad lines in Talbot County, and facilities in general are favorable for the conduct and development of most of the forest industries found here.

TALBOT COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	1,444,000 Board Feet	$18.00 per M	$25,992
Softwood	5,369,000 Board Feet	15.00 per M	80,535
Pulpwood	350 Cords	6.00 per Cord	2,100
Railroad Ties	2,000	.45 each	900
Piling	20,000 Lineal Feet	.08 per Foot	1,600
Cordwood: Oak	2,800 Cords	3.50 per Cord	9,800
Pine	4,200 Cords	2.50 per Cord	10,500
Staves	350,000 Pieces	7.50 per M	2,625
Poles	800	2.75 each	2,200
Shingles	85,000	4.25 per M	361
Lath	129,000	3.25 per M	419
Posts	1,200	.15 each	180
The County	1,274,994 Cubic Feet		$137,212

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	33,025	14,369	43	52,795	45,247	98,042	$211,180	$226,235	$437,415
2	21,217	3,699	17	1,734	18,620	20,354	6,936	93,100	100,036
3	43,253	13,613	32	10,598	23,382	34,980	42,392	116,910	159,302
4	50,676	11,955	24	20,186	32,829	53,015	80,744	164,145	244,889
5	10,609	2,186	21	557	7,292	7,849	2,228	36,460	38,688
The County	158,780	45,822	29	85,870	127,370	214,240	$343,480	$636,850	$980,330

MAP (

TALBOT C

SHOWING

FOREST A

BY

COMMERCIAL

PREPARED

F. W. BES

MARYLAND BOARD

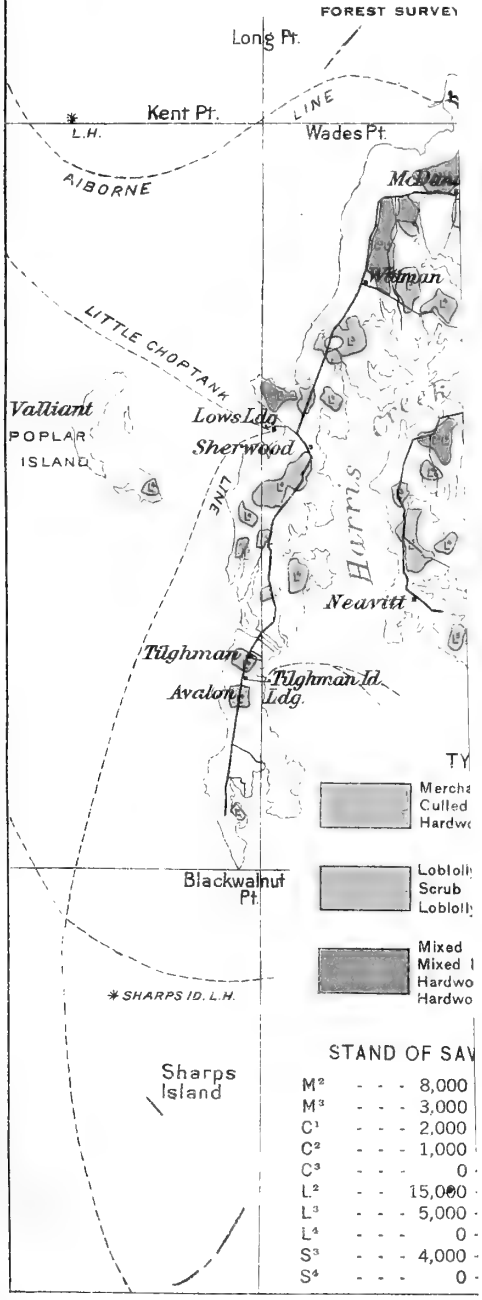
WM. BULLOCK CLARK

EXECUTIVE OFFICER

1915

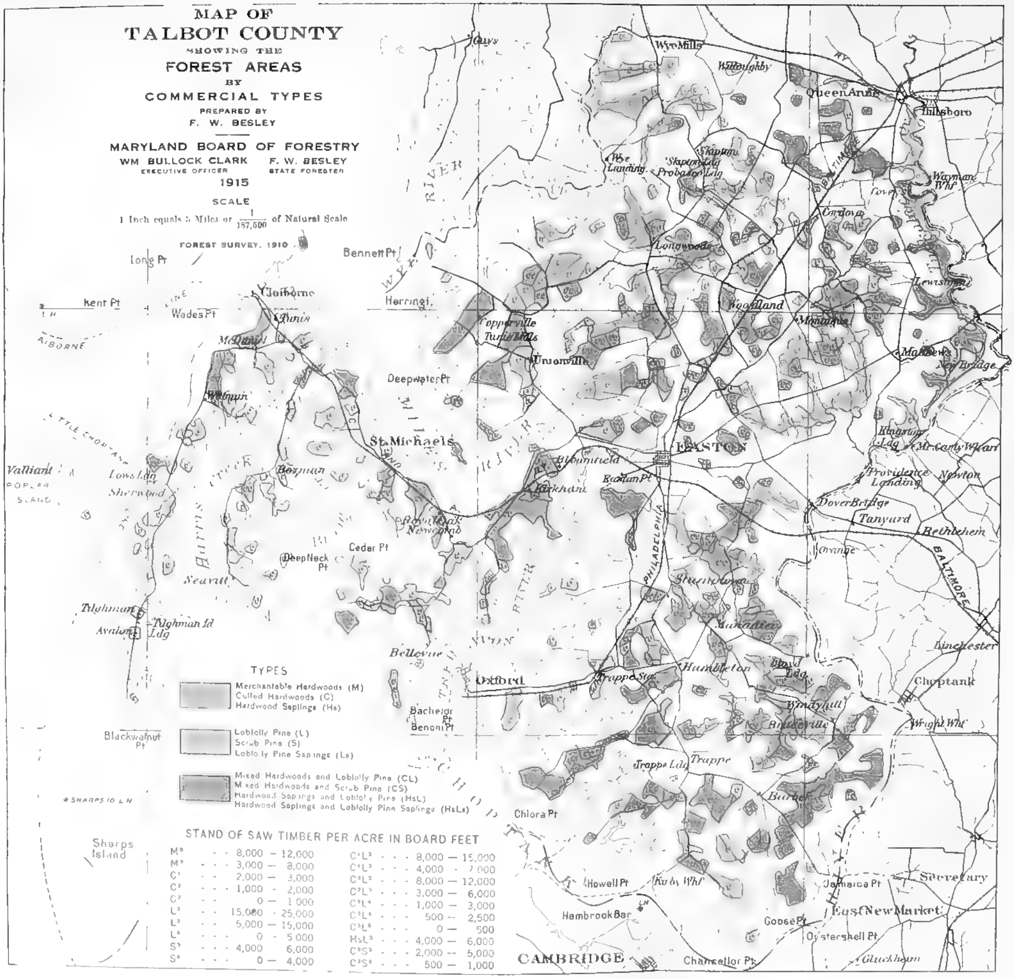
SCALE:

1 Inch equals 3 Miles or $\frac{1}{187,5}$



STAND OF SAV

M²	8,000
M³	3,000
C¹	2,000
C²	1,000
C³	0
L²	15,000
L³	5,000
L⁴	0
S³	4,000
S⁴	0


MAP OF
TALBOT COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK EXECUTIVE OFFICER
F. W. BESLEY STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1910
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Scrub Pine (S)
Loblolly Pine Saplings (Ls)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Scrub Pine (CS)
Hardwood Saplings and Loblolly Pine (HsL)
Hardwood Saplings and Loblolly Pine Saplings (HsLs)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
M - 8,000 — 12,000
M - 3,000 — 8,000
C - 2,000 — 3,000
C - 1,000 — 2,000
C - 0 — 1,000
L - 15,000 — 25,000
L - 5,000 — 15,000
L - 0 — 5,000
S - 4,000 — 6,000
S - 0 — 4,000
C¹L³ - 8,000 — 15,000
C¹L³ - 4,000 — 7,000
C²L² - 8,000 — 12,000
C²L³ - 3,000 — 6,000
C²L⁴ - 1,000 — 3,000
C³L⁴ - 500 — 2,500
C³L⁵ - 0 — 500
HsL³ - 4,000 — 6,000
C²S³ - 2,000 — 5,000
C³S⁴ - 500 — 1,000
Wye Mills
Willoughby
Queen Anne
Hillsboro
Wye Landing
Skipton Ldg
Probasco Ldg
Wayman Whf
Cordova
Longwoods
Lewistown
Woodland
Matthews
New Bridge
Copperville
Tunis Mills
Unionville
Deepwater Pt
Bennett Pt
Long Pt
Claiborne
Kent Pt
Wades Pt
Tunis
McDaniel
Wittman
St. Michaels
Bloomfield
Easton
Kingston Ldg
Newton
Providence Landing
Dover Bridge
Tanyard
Bethlehem
Kirkham
Royal Oak
Newcomb
Cedar Pt
Deep Neck Pt
Valliant
Poplar Island
Lows Ldg
Sherwood
Bozman
Harris Creek
Nevitt
Tilghman
Tilghman Id Ldg
Avalon
Bellevue
Oxford
Trappe Sta
Hambleton
Linchester
Choptank
Bachelor Pt
Benoni Pt
Blackwalnut Pt
Trappe Ldg
Trappe
Wright Whf
Chlora Pt
Barber
Sharps Island
Howell Pt
Jamaica Pt
Secretary
Hambrook Bar
East New Market
Goose Pt
Oystershell Pt
Cambridge
Chancellor Pt
Philadelphia
Baltimore
Wye River
Miles River
Tred Avon River
Choptank River

WASHINGTON COUNTY.

Washington is one of the four mountain counties of the State, and lies in three different physiographic divisions. The western section forms a part of the Appalachians; the central lies in the Hagerstown Valley; while the eastern half is included in the Blue Ridge Mountains. The suface and soil conditions are in consequence variable.

To Washington County attaches the distinction of being, at Hancock, the narrowest part of Maryland, as at that point, from north to south, it is but two miles from Pennsylvania to West Virginia. In shape Washington County is not unlike a triangle, with the western end extended to join the Allegany County line. Frederick County is to the east, Pennsylvania on the north, and West Virginia and the Potomac River to the south. The highest elevation is Quirauk Mountain in the Blue Ridge, 2,145 feet above sea-level, while the lowest, only 260 feet, is in the southeastern section near the Potomac. The soils of the Blue Ridge are generally sandy loams, while those prevailing in the Allegany Mountains are usually somewhat stiffer, with a greater proportion of clay. The soils of the Hagerstown Valley are of a clay-loam type, and the most productive in the State.

The Forests.

The county has a present wooded area placed at 24 per cent. Probably one-half of the forests are in the western quarter of the county, and much of the remainder in the extreme east, with farm lands and scattering woodlots between. It is on these middle areas, however, where the trees are in great part growing on fertile soils, that the heaviest stands of timber may be found, though in size such areas are by far too small ever to rank as large producers. There is no pine of any consequence in the eastern or central portions of the county, but some considerable stands in the west where it grows in mixture with hardwoods, though nowhere constituting an important part of the forest. Although several pines occur, the prevailing species is the scrub pine, of small size and little value.

Chief among the hardwoods on the ridges and upper slopes in the western mountain sections are scarlet oak, chestnut oak, and chestnut; with black, white and red oaks on the lower slopes; white oak, ash, elm, and tulip in the ravines. The occurrence and distribution

of species in the Blue Ridge or eastern mountain section is very much the same, except that there is practically no pine, and greater amounts of chestnut and chestnut oak. The most important timber producers of the valley or central forests, in order of relative abundance, are the black, white and red oaks, hickory, ash, elm, black walnut, and maple, with black locust occurring in small patches throughout the county.

The forests of Washington County, by the State's Survey of 1911, are 83 per cent hardwood, 1 per cent pine, and 16 per cent mixed hardwood and pine. There are 4,022 acres of mixed hardwoods containing timber estimated at 5,000 board feet or over per acre, and 56,160 acres where the stand is below this figure; the 599 acres of pure pine, and the 11,493 acres of hardwood and pine, all amount to less than 5,000 feet per acre.

USES OF THE FORESTS.

There are 26 mill and timber men in Washington County who reported a cut of 1,485,950 cubic feet for 1914, with a value of $190,850. The lumber cut was, and is, a very heavy item of the total, followed by considerable quantities of railroad ties, poles, cordwood, tanbark, pulpwood, mine props, posts and pinwood, the latter principally locust for telephone use. The cut of ties is especially large, which is not surprising in view of the fact that in this county there are 32 miles of electric lines and 91 of steam, it ranking next to Baltimore County in having the largest railway mileage in the State.

Due in part, no doubt, to its facilities for transportation, Washington County is a most important producer and manufacturer of timber. The cut of lumber is practically all of hardwood, and this finds a ready sale not only in points outside, but in the largest city, Hagerstown, which ranks high in the State in size and number of wood-using industries. There are yards for selling lumber at Boonsboro, Cavetown, Hancock, Keedysville, Maugansville, Sharpsburg and Williamsport, planing mills at Hancock and Williamsport, and a furniture factory at Clear Spring, but the centre of the county's activities along these lines is of course at Hagerstown. Reached by a network of railways, the city is well suited for manufacturing, and its plants for the manufacture of forest products are especially well developed. There are 6 yards and planing mills, nearly all of them of considerable size; 6 furniture plants; 2 plants manufacturing wheel stock and 1, carriages; 1 refrigerator door plant; 1 large pipe organ manufactory; 1 plant turning out telephone pins; and 1 other which manufactures ironing boards, phonographs and novelties. These several industries mean, for the county, the employment of 1,285 men,

and the annual consumption of 17,500,000 board feet of wood. From the standpoint of labor and profitable markets for raw material produced, Washington County could not afford to be without them.

Although such industries are not always directly dependent for their operation upon nearby forest resources, there are a goodly number of them which rely upon local woodlands for the timber they manufacture. The owners of the latter in turn depend upon the Hagerstown market, and a trade between them has been built up which is invaluable to both, and of actual cash value to the county as a whole. Right management of local forests will contribute to a maintenance of the present cut and a continuation of the dependent industries. In the past the mountain forests, the most extensive in the county, have been greatly damaged, repeatedly, by fires. This is especially true of the section in the northern Blue Ridge and that along the Potomac west of Hancock, railroads in both cases having been the chief offenders in the past. Adequate fire protection throughout the county, active and hearty co-operation on the part of residents, and a general improvement in prevalent farm woodlot management, are the surest means to guarantee a sustained forest production and a continuance of the forest industries which must depend upon it.

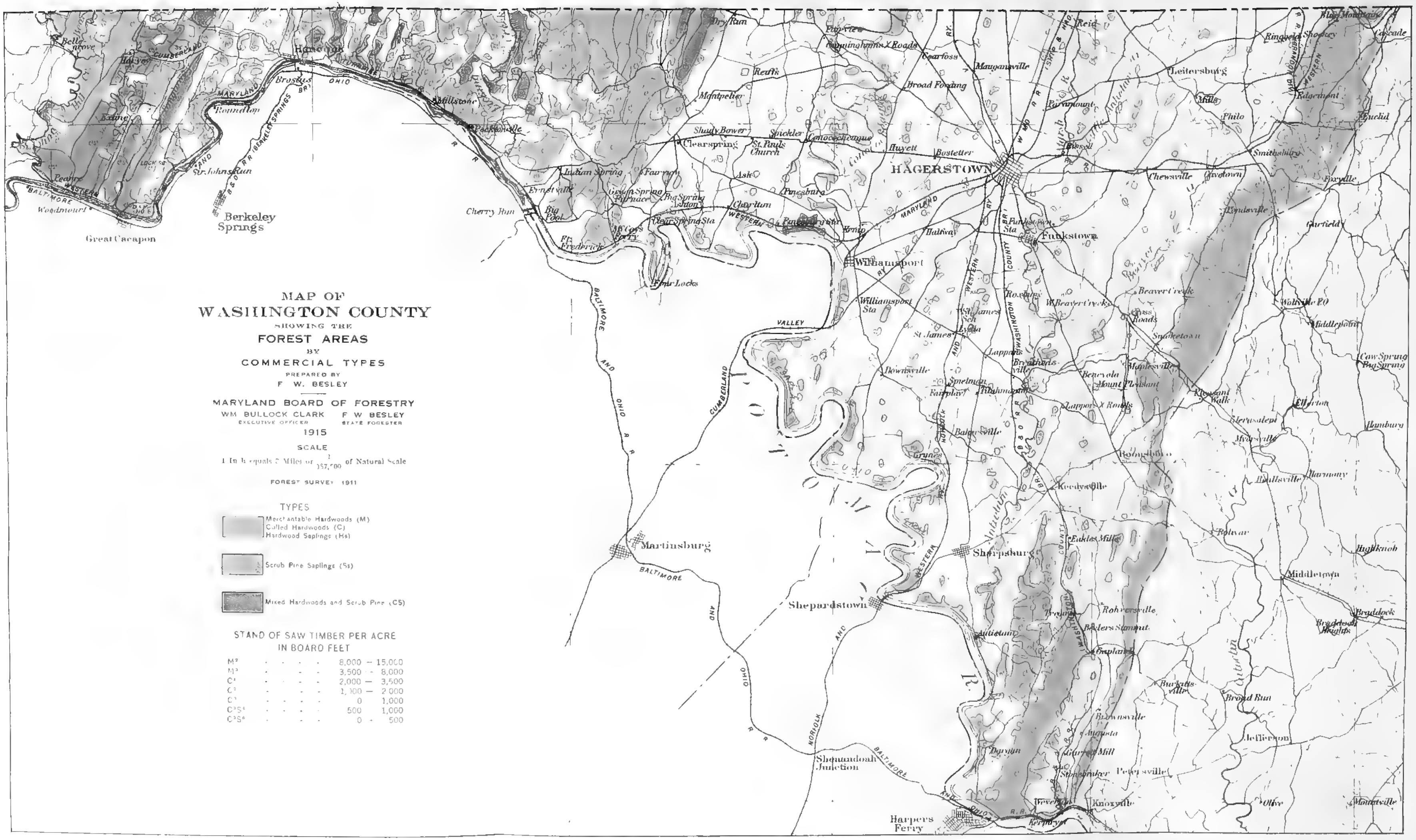
WASHINGTON COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	4,685,000 Board Feet	$18.00 per M	$84,330
Softwood	65,000 Board Feet	16.00 per M	1,040
Pulpwood	900 Cords	6.50 per Cord	5,850
Railroad Ties: White Oak	29,000	.65 each	18,850
Mixed Oak	28,000	.40 each	11,200
Chestnut	29,100	.20 each	5,820
Cordwood	4,500 Cords	2.75 per Cord	12,375
Mine Props	2,270 Tons	2.50 per Ton	5,675
Tan Bark	1,100 Tons	8.50 per Ton	9,350
Poles	8,500	3.00 each	25,500
Mine Ties	10,000	.15 each	1,500
Posts	36,000	.15 each	5,400
Pinwood	440 Cords	9.00 per Cord	3,960
The County	1,485,950 Cubic Feet		$190,850

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $4.50 per M.	Total $
1	16,271	2,230	14	4,547	.....	4,547	$18,188	.....	$18,188
2	13,915	881	6	1,764	73	1,837	7,056	$328	7,384
3	1,041	34	3	195	.....	195	780	.....	780
4	27,177	6,525	24	6,780	670	7,450	27,120	3,015	30,135
5	34,713	18,507	53	18,535	1,030	19,565	74,140	4,635	78,775
6	16,906	2,848	17	6,848	.....	6,848	27,392	.....	27,392
7	12,952	6,805	53	9,798	.....	9,798	39,192	.....	39,192
8	13,860	5,305	38	4,498	.....	4,498	17,992	.....	17,992
9	15,101	372	2	2,154	.....	2,154	8,616	.....	8,616
10	1,408	339	24	1,513	.....	1,513	6,052	.....	6,052
11	10,521	1,764	17	3,000	.....	3,000	12,000	.....	12,000
12	11,545	629	5	3,186	.....	3,186	12,744	.....	12,744
13	17,303	1,128	7	3,716	.....	3,716	14,864	.....	14,864
14	6,763	4,159	61	4,603	.....	4,603	18,412	.....	18,412
15	32,890	9,719	30	11,219	184	11,403	44,876	828	45,704
16	18,039	6,020	33	16,524	.....	16,524	66,096	.....	66,096
17	411	15	36	40	.....	40	160	.....	160
18	10,769	290	3	1,453	.....	1,453	5,812	.....	5,812
19	8,836	764	9	1,306	.....	1,306	5,224	.....	5,224
20	18,222	1,912	10	5,310	.....	5,310	21,240	.....	21,240
21	658	111	17	538	.....	538	2,152	.....	2,152
22	4,428	92	2	412	.....	412	1,648	.....	1,648
23	2,173	1,452	67	3,730	121	3,851	14,920	545	15,465
24	4,719	189	4	853	.....	853	3,412	.....	3,412
25	4,501	184	4	540	.....	540	2,160	.....	2,160
The County	305,122	72,274	24	113,062	2,078	115,140	$452,248	$9,351	$461,599


MAP OF
WASHINGTON COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
EXECUTIVE OFFICER
F W BESLEY
STATE FORESTER
1915
SCALE
FOREST SURVEY 1911
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Scrub Pine Saplings (Ss)
Mixed Hardwoods and Scrub Pine (CS)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
HAGERSTOWN
Williamsport
Martinsburg
Shepardstown
Sharpsburg
Funkstown
Keedysville
Boonsboro
Smithsburg
Leitersburg
Hancock
Clearspring
Berkeley Springs
Great Cacapon
Harpers Ferry
Shenandoah Junction
Knoxville
Middletown
Braddock
Jefferson
Petersville
Cherry Run
Four Locks
BALTIMORE AND OHIO R.R.

WICOMICO COUNTY.

Wicomico County occupies a position on the Eastern Shore peninsula just south of the Delaware State-line. It is of rectangular shape, bordered on the west by Dorchester County, on the south by Somerset and Worcester, and also on the east by Worcester. The Wicomico and Nanticoke Rivers, together with Quantico Creek, furnish the county with tide-water transportation for a considerable distance, for the surface is very flat, with an elevation which varies from sea-level in the west to about 80 feet near Parsonsburg, in the east-central part. Along the Nanticoke, and to a lesser extent the Wicomico, there are considerable areas of salt-water marsh. Fresh-water swamps also occur in the eastern and western parts of the county, and it is in the southern portion that the principal hardwood stands are located. The central part is better drained, containing the bulk of the pure pine stands. The soil is generally sandy, and wherever the elevation is sufficient to give good drainage the land has been largely cleared and cultivated. There is, on the other hand, some land, once cleared, that was allowed to grow up again in pine after its fertility had been exhausted.

The Forests.

In this county there is 46 per cent of woodland, and the county stands well as a timbered and timber-producing district. The large percentage of undrained soils which are only suited for the growing of timber accounts chiefly for the large forested area, making the forest interests of this county of great importance, and on the whole, partly because of extensive abandonment of exhausted lands, this forested area is apparently increasing. Considered as a county, there seems little variety in the size and range of the forests. There are some very large hardwood stands in the west, but on the whole the wooded areas are pretty evenly distributed, irregular in outline, and generally following drainage contours in more or less connected bodies.

There is practically five times as much pine in the county as hardwood, with loblolly constituting 95 per cent, and the balance largely scrub pine, with a small amount of cypress in the eastern part. Scrub pine in small patches is found principally in the eastern and western parts of the county, although the stand of timber is nowhere very heavy. There are few hardwood stands that do not contain some scat-

tered pine. In such mixed stands the pine, being generally more valuable, is usually cut to a small diameter limit, while the less desirable hardwoods — black gum, red maple, and scrubby oaks — are left in full possession of the land. This is particularly true in swampy places where the more valuable hardwoods do not thrive, and the pine only occurs on hummocks or where surface conditions will permit. The best pine grows in the central, and especially the south-central, part, while the heaviest hardwood stands occur in the extreme eastern and western parts.

The Forest Survey made in 1908 shows that this county's woodlands are 23 per cent hardwood, 38 per cent pine, and 39 per cent mixed hardwood and pine. There are only 112 acres of hardwoods exceeding 5,000 board feet per acre, with 24,852 acres where the stand is less; 7,018 acres of pine, 5,000 board feet and above per acre, and 35,596 acres of less; and 1,270 acres in mixed stands which equal or exceed 5,000 feet, and 42,760 acres which fall below.

USES OF THE FORESTS.

Wicomico County has a heavy cut of timber, with more sawmill and timber operators, 64, than any other county in the State. Their cut for 1914 fell below that of only two others, Charles and Garrett, and amounted to 3,949,470 cubic feet of wood, worth $592,318. However, it has the heaviest cut of pine in Maryland, that product being followed in order of value by piling, staves, cordwood, mine props, railroad ties, lath, poles, and shingles. It may be remarked here that this county has the second largest cut of staves in the State, while in piling it easily leads. The cut of cordwood is also heavy, and consists principally of pine, much of which finds its way via the Chesapeake route to Baltimore.

Wicomico is no doubt the second most important county of Maryland as regards the number and size of its wood-using industries. The heavy stands of timber occurring locally, 43 miles of railway lines, and the excellent facilities for water shipments, all contribute to this. There are yards or planing mills at Hebron, Pittsville, Salisbury, Sharptown, and Wango; crate factories at Powellsville, Salisbury, Sharptown, Wango, and Willards; a boat yard at Sharptown; basket manufactories at Wango, Willards, and Powellsville; and plants turning out boxes at Sharptown and Willards. In Salisbury alone there are six planing mills, five yards, six box factories, three plants for making crates, two basket factories, one wagon works, one plant making chairs, and one for building ships. Salisbury is practically the

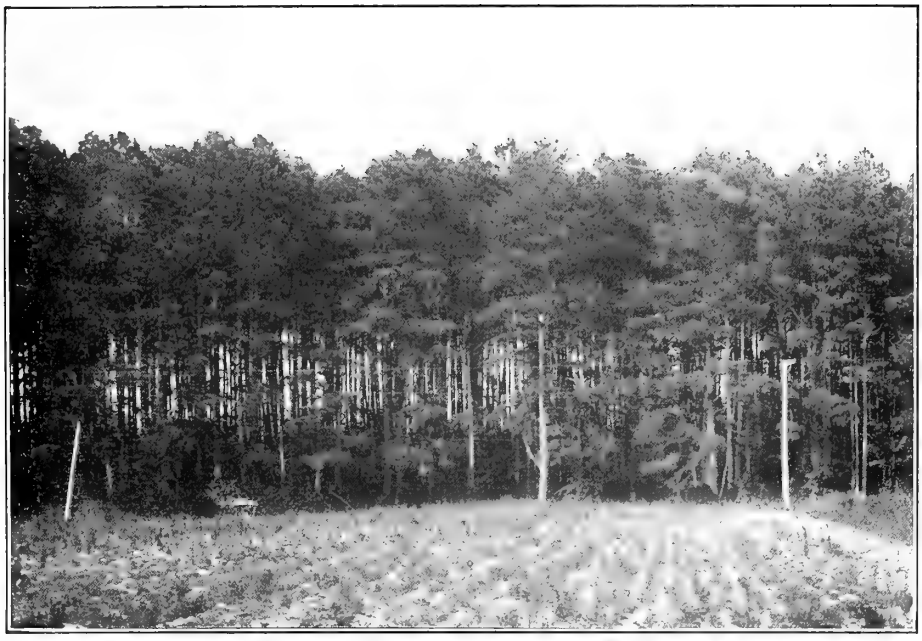


PLATE XVI. FIG. 1.—LOBLOLLY PINE.

Pre-eminently a species of the Eastern Shore, loblolly pine in extensive stands of straight, tall, well-formed trees easily takes rank as the leading and most valuable "softwood" of the State.

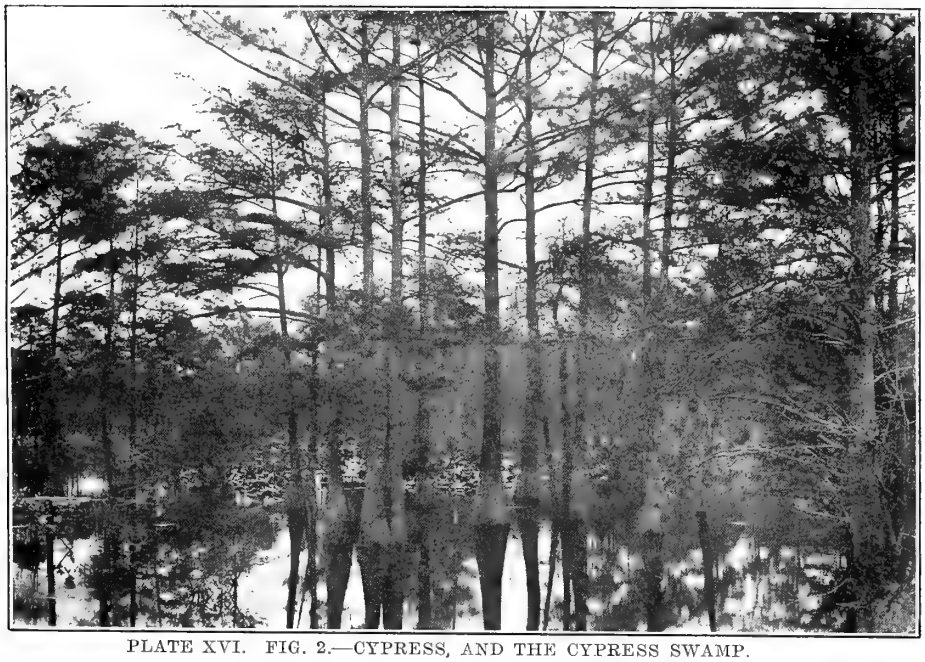


PLATE XVI. FIG. 2.—CYPRESS, AND THE CYPRESS SWAMP.

Another characteristic species of the Eastern Shore, the bald cypress gives an almost tropical touch to those Maryland forests. The "knees" and the conditions giving rise to them are very evident here.

center of wood-working for the Eastern Shore, one of the chief cities of the State in this respect, and the forest industries of Wicomico County are of great value and importance.

Constructive forest management will aid to their continuance as such, for nearly all are plants relying in large degree upon a local source of timber.

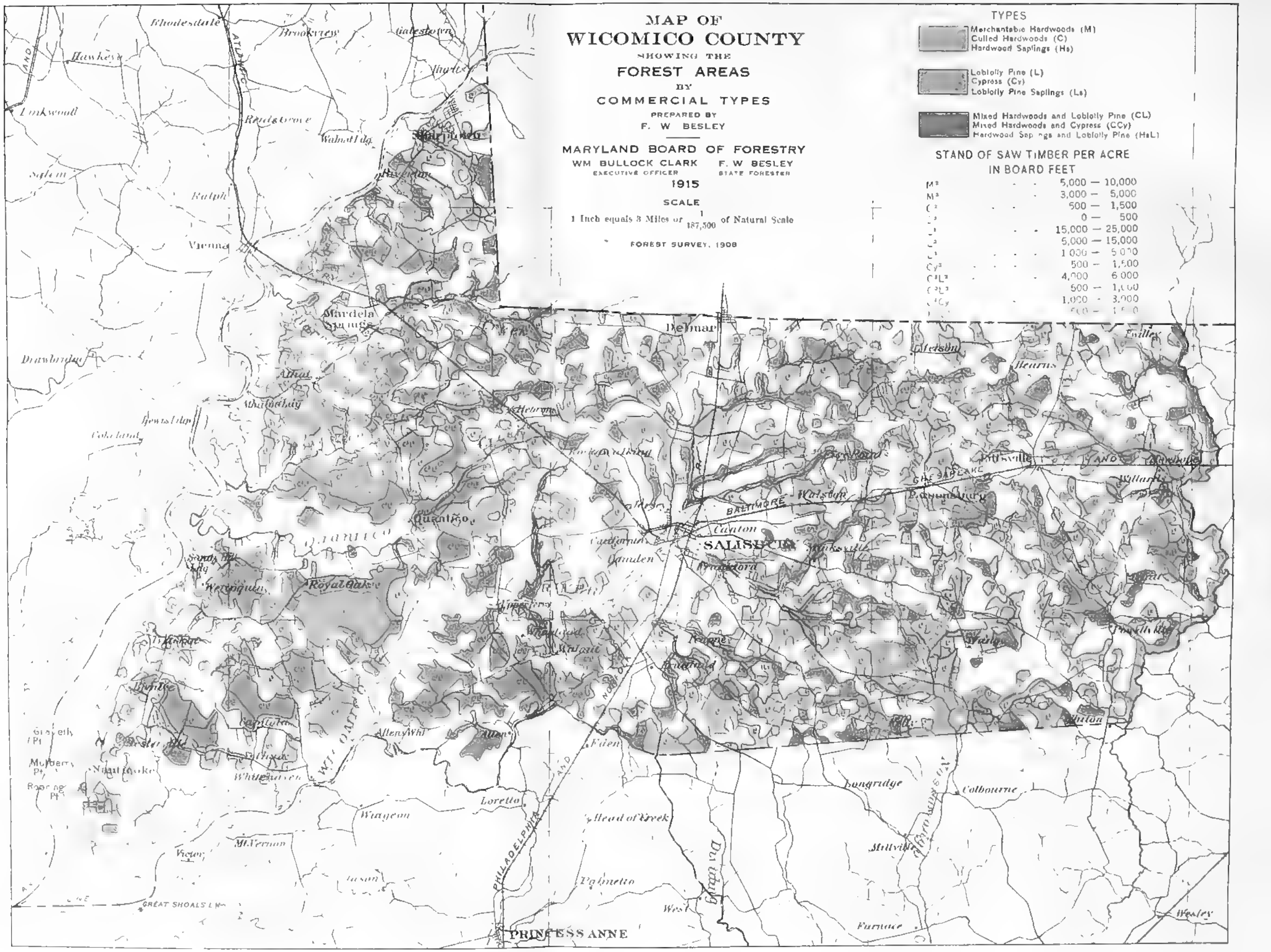
WICOMICO COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	2,005,000 Board Feet	$18.00 per M	$36,090
Softwood	17,335,000 Board Feet	16.00 per M	277,260
Railroad Ties	25,000	.50 each	12,500
Piling	1,450,000 Lineal Feet	.10 per Foot	145,000
Cordwood: Oak	1,572 Cords	3.50 per Cord	5,502
Pine	7,103 Cords	2.50 per Cord	17,758
Mine Props	6,777 Tons	2.25 per Ton	15,248
Staves	10,250,000 Pieces	7.50 per M	76,875
Poles	1,000	2.75 each	2,750
Shingles	20,000	4.25 per M	85
Lath	1,000,000	3.25 per M	3,250
The County	3,949,470 Cubic Feet		$592,318

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	30,664	12,311	40	3,414	5,301	78,715	$13,656	$26,505	$40,161
2	28,316	14,151	50	3,015	6,701	9,716	12,060	33,505	45,565
3	17,156	7,472	44	1,684	11,505	13,189	6,736	57,525	64,261
4	36,592	16,042	44	4,043	10,148	14,191	16,172	50,740	66,912
5	27,955	12,361	44	1,725	9,790	11,515	6,900	48,950	55,850
6	14,809	7,032	47	1,995	5,120	7,115	7,980	25,600	33,580
7	18,433	13,812	75	2,558	7,161	9,719	10,232	35,805	46,037
8	21,117	13,563	64	1,421	28,283	29,704	5,684	141,415	147,099
9	15,600	5,704	37	524	4,729	5,253	2,096	23,645	25,741
10	6,122	2,915	48	185	3,936	4,121	740	19,680	20,420
11	9,011	3,336	37	533	2,985	3,518	2,132	14,925	17,057
12	12,660	2,565	20	217	4,978	5,195	868	24,890	25,758
13	2,840	344	12	6	518	524	24	2,590	2,614
The County	242,275	111,608	46	21,320	101,155	122,475	$85,280	$505,775	$591,055


MAP OF
WICOMICO COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
F. W. BESLEY
MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK EXECUTIVE OFFICER
F. W BESLEY STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187,500 of Natural Scale
FOREST SURVEY, 1908
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Hardwood Saplings (Hs)
Loblolly Pine (L)
Cypress (Cy)
Loblolly Pine Saplings (Ls)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Cypress (CCy)
Hardwood Saplings and Loblolly Pine (HsL)
STAND OF SAW TIMBER PER ACRE
IN BOARD FEET
5,000 — 10,000
3,000 — 5,000
500 — 1,500
0 — 500
15,000 — 25,000
5,000 — 15,000
500 — 1,500
Delmar
SALISBURY
Mardela Springs
Hebron
Quantico
Royal Oak
Fruitland
Pittsville
Willards
Powellville
Vienna
Rhodesdale
Linkwood
Salem
Ralph
Allen
Eden
Loretto
Wingeon
Mt Vernon
Whitehaven
Longridge
Colbourne
Millville
Head of Creek
Palmetto
Furnace
PRINCESS ANNE
GREAT SHOALS LN
PHILADELPHIA
BALTIMORE
Gravelly Pt
Mulberry Pt
Roaring Pt

WORCESTER COUNTY.

Worcester, the southernmost county of the State, is also the only one to front on the Atlantic Ocean. It is of irregular shape, generally long and narrow, with the Chincoteague, Sinepuxent and Assawoman Bays in the east, Delaware on the north, Wicomico County on the northwest, Somerset County on the west, and Virginia on the south. With its low, flat surface, all of it less than 50 feet above sea-level, mild, even climate and sandy soil, it is very much the opposite, topographically and generally, from Garrett County at the State's other extreme, where mountains, heavy forests of hardwood, and a rigorous climate prevail. Here the chief topographic features are the ocean front, outlined by a sand bar which extends in an even line northeast and southwest, and behind this protecting bar a number of bays from which numerous, though short, tidal streams extend inland. The Pocomoke River, navigable for steamboats as far as the county seat, Snow Hill, forms the principal drainage system of the county, and at the same time is its chief means of water transportation. Local soils are for the most part sandy, with good sand loams in the more exhausted northern and central portions.

The Forests.

Worcester has the greatest percentage of forest of any county on the Eastern Shore, 47 per cent of its total area in land being wooded, in spite of the fact that in different parts of the county, the northeastern section especially, large areas have been cleared of forest during the past 10 years. The principal species at present here, as in most of the Eastern Shore counties, is the loblolly pine. There are a few small areas of cypress along the Pocomoke and its tributaries, this county containing more cypress timber than any other in Maryland. The southwestern half of the county contains the greatest areas in pure pine stands, while in the northeastern section the pine is generally in mixture with hardwoods. The stands of hardwood are for the most part small and scattered, usually occurring along the shores of streams. Principal among them are some of the oaks — white, swamp white, black, Spanish, and willow — red maple, red gum, and black gum. Hardwoods are of relatively minor importance, but the amount of standing pine timber is only exceeded in Dorchester County, and the total stumpage in Dorchester and Garrett.

From the Survey of 1914 it is apparent that only 22 per cent of the county's woodlands are in mixed hardwood stands, 59 per cent being in pine, and 19 per cent in mixtures of each. There are 15,869 acres of hardwoods containing stands amounting to 5,000 or more board feet per acre, with 18,241 acres amounting to less; of the pine, there are 7,902 acres averaging over 5,000 feet, and 77,387 acres where the stands are less; while the mixed stands are all of less than 5,000 feet per acre, and comprise an area of 28,783 acres.

USES OF THE FORESTS.

Worcester County has a total of 51 large mill and timber operators, and a cut of timber which ranks high among the county's sources of employment and revenue. In 1914 it aggregated 3,525,700 cubic feet of wood, the value at shipping points being quoted at $467,191. Lumber was the most valuable product, with staves, in which this county leads, coming next, then piling, barrels, cordwood, mine props, poles, lath, shingles, railroad ties, and barrel headings. Railway lines totalling 57 miles, together with the exceptional water facilities, are an aid to the profitable conduct of the local timber business. The cut is important, and is reflected in the number of wood-using industries now in operation here. Berlin has two planing mills and yards, with a plant producing baskets and dishes; Pocomoke City, three yards and planing mills, and plants for manufacturing crates, baskets, barrels, box shooks, and boats; and Snow Hill, three yards, two planing mills, with planing mills at Girdletree and Stockton. Stockton and Girdletree also manufacture barrels; Whaleysville, crates and baskets; Showell, boxes and baskets.

Worcester County's forests do not suffer much from fires, the low elevation, to a certain degree, preventing this; they are adequate in area for the county's present needs; and they are at present supplying most of the forest industries in operation here. It would seem that only more efficient management is needed to make the forests increasingly productive, the forest industries a continued source of benefit and value to this section.

WORCESTER COUNTY.

SUMMARY OF THE LUMBER AND TIMBER CUT.

Product.	Amount.	Unit Value.	Total Value.
Lumber: Hardwood	3,835,000 Board Feet	$18.00 per M	$69,030
Softwood	13,035,000 Board Feet	16.00 per M	208,560
Railroad Ties	4,500	.50 each	2,250
Piling	410,000 Lineal Feet	.10 per Foot	41,000
Cordwood: Oak	1,100 Cords	3.50 per Cord	3,850
Pine	3,000 Cords	2.50 per Cord	7,500
Mine Props	4,460 Tons	2.25 per Ton	10,035
Staves and Headings	14,820,000 Pieces	7.33+ per M	108,720
Poles	3,000	3.00 each	9,000
Shingles	795,000	4.25 per M	3,379
Lath	1,190,000	3.25 per M	3,867
The County	3,525,700 Cubic Feet		$467,191

WOODED AREA, STAND AND VALUE OF SAW TIMBER BY ELECTION DISTRICTS.

Dist. No.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $4.00 per M.	Pine $5.00 per M.	Total $
1	26,764	13,283	50	2,538	22,586	25,124	$10,152	$112,930	$123,082
2	48,857	19,560	40	7,582	30,242	37,824	30,328	151,210	181,538
3	41,845	14,578	35	8,153	22,478	30,631	32,612	112,390	145,002
4	27,747	14,795	53	5,540	19,559	25,099	22,160	97,795	119,955
5	24,204	7,467	31	3,733	10,409	14,142	14,932	52,045	66,977
6	24,092	15,899	66	6,726	20,119	26,845	26,904	100,595	127,499
7	45,631	31,274	69	14,212	49,739	63,951	56,848	248,695	305,543
8	36,584	16,891	46	3,212	31,255	34,467	12,848	156,275	169,123
9	37,231	14,435	39	19,127	15,220	34,347	76,508	76,100	152,608
The County	312,955	148,182	47	70,823	221,607	292,430	$283,292	$1,108,035	$1,391,327

WOODED AREA, STAND AND VALUE OF SAW TIMBER IN MARYLAND, BY COUNTIES.

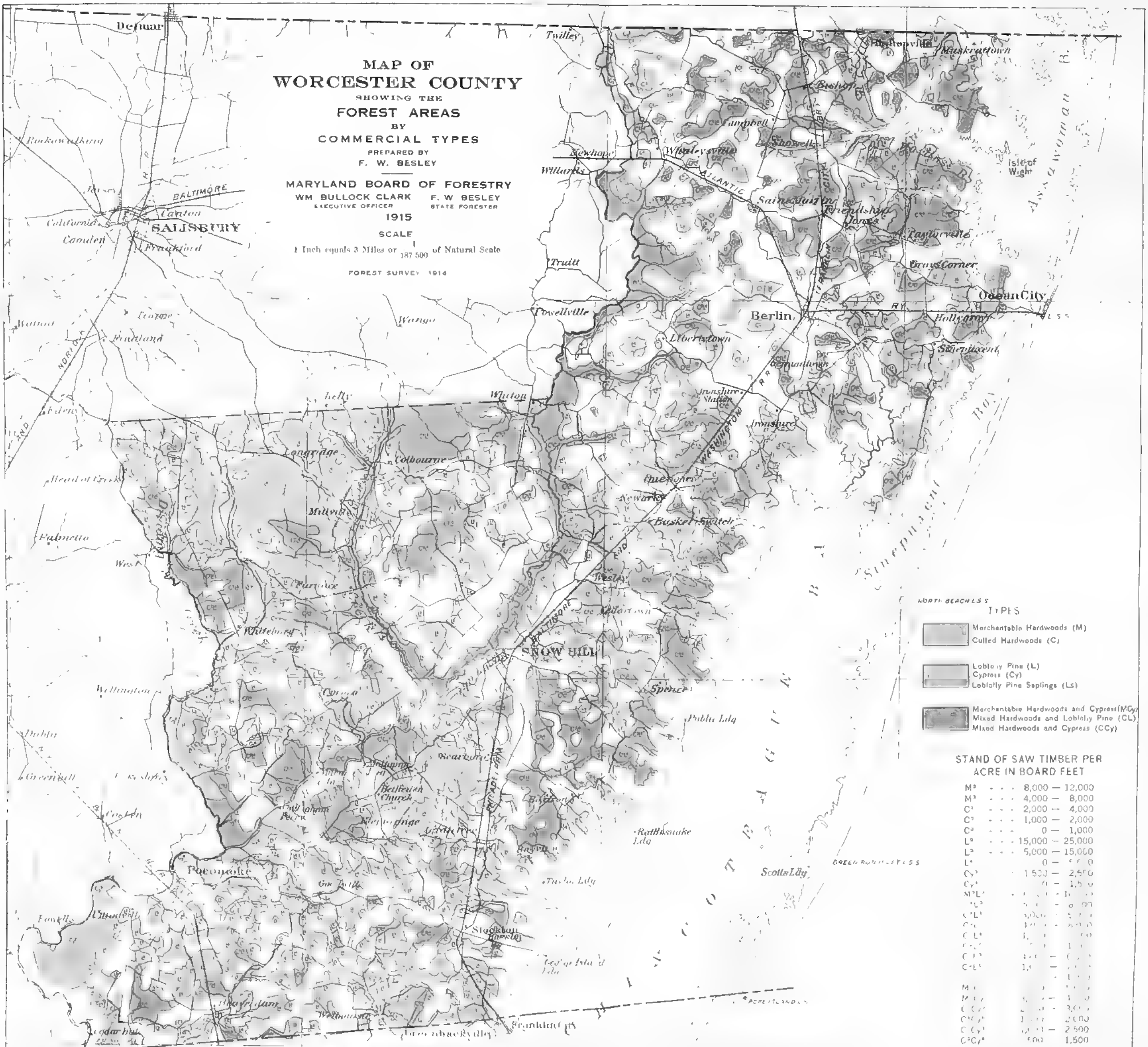
County.	Total Land Area.	Wooded Area.	Per Cent Wooded.	Stand of Saw Timber in Board Feet (Doyle Log Rule). All Trees More Than Nine Inches in Diameter.			Stumpage Value.		
	Acres.	Acres.	%	Hardwood M Bd. Ft.	Pine M Bd. Ft.	Total M Bd. Ft.	Hardwood $5.00 per M.	Pine $5.00 per M.	Total $
Allegany ...	266,363	163,832	62	105,369	42,073	147,442	$369,107	$208,292	$577,399
A. Arundel .	274,500	92,266	34	122,314	6,203	128,517	550,413	31,015	581,428
Baltimore ..	403,181	103,515	24	201,352	7,991	209,343	1,006,760	39,955	1,046,715
Calvert	139,332	62,390	45	70,886	7,752	78,638	283,546	31,006	314,552
Caroline ...	208,350	62,834	30	31,277	61,862	93,139	125,108	309,350	434,458
Carroll	296,029	39,292	13	85,377	179	85,556	426,885	895	427,780
Cecil	223,197	53,543	24	89,332	.....	89,332	357,328	.....	357,328
Charles	290,546	171,547	59	163,989	88,281	252,270	655,956	353,124	1,009,080
Dorchester .	368,669	138,291	37	81,024	315,305	396,329	324,096	1,576,525	1,900,621
Frederick ..	433,130	91,117	21	126,690	261	126,951	570,105	1,175	571,280
Garrett	436,621	274,483	63	432,115	15,651	447,766	1,728,460	78,255	1,806,715
Harford ...	283,009	81,872	29	147,204	148	147,352	736,020	740	736,760
Howard ...	159,442	38,644	25	99,218	110	99,328	496,090	550	496,640
Kent	179,872	33,776	19	49,860	159	50,019	249,300	795	250,095
Montgomery	302,881	68,821	22	130,340	7,513	137,853	651,700	37,565	689,265
Pr. George's	306,872	127,200	41	107,844	68,783	176,627	431,376	275,132	706,508
Q. Anne's .	231,770	59,270	26	65,559	14,541	80,100	295,015	72,705	367,720
St. Mary's .	233,963	119,080	51	80,564	84,266	164,830	322,256	342,464	664,720
Somerset ..	273,180	68,387	25	19,358	154,741	174,099	77,432	706,305	783,737
Talbot	158,780	45,822	29	85,870	127,370	214,240	343,480	636,850	980,330
Washington	305,122	72,274	24	113,062	2,078	115,140	452,248	9,351	461,599
Wicomico ..	242,275	111,608	46	21,320	101,155	122,475	85,280	505,775	591,055
Worcester ..	312,955	148,182	47	70,823	221,607	292,430	283,292	1,108,035	1,391,327
The State	6,330,039	2,228,046	35	2,500,747	1,328,029	3,829,776	$10,821,253	$6,325,859	$17,142,112

SUMMARY OF THE 1914 LUMBER AND TIMBER PRODUCTION OF MARYLAND, BY COUNTIES.

County.	Mills and Operators.	Cut in Cubic Feet.	Value.
Allegany	45	3,141,400	$440,754
Anne Arundel	22	1,099,610	130,099
Baltimore	30	2,119,584	308,186
Calvert	20	1,448,475	202,597
Caroline	61	1,546,000	178,654
Carroll	25	991,960	118,800
Cecil	24	716,780	96,893
Charles	30	5,838,080	484,866
Dorchester	37	2,231,160	352,405
Frederick	51	809,965	179,004
Garrett	62	7,750,245	1,379,937
Harford	27	774,555	118,342
Howard	12	599,455	64,696
Kent	10	382,870	53,047
Montgomery	28	1,215,545	175,422
Prince George's	32	1,388,000	161,939
Queen Anne's	26	690,205	83,363
St. Mary's	33	1,226,755	157,002
Somerset	46	2,742,423	363,174
Talbot	38	1,274,994	137,212
Washington	26	1,485,950	190,850
Wicomico	64	3,949,470	592,318
Worcester	51	3,525,700	467,191
The State	800	46,949,181	$6,436,751

SUMMARY OF THE 1914 LUMBER AND TIMBER PRODUCTION OF MARYLAND, WITH BY-PRODUCTS, IN ORDER OF RELATIVE IMPORTANCE.

Product.	Amount.	Value.
Hardwood Lumber	129,105,500 Board Feet	$2,325,127
Pine Lumber	99,922,000 Board Feet	1,498,336
Pulpwood	74,002 Cords	444,029
Railroad Ties	925,392	440,685
Piling	3,563,800 Lineal Feet	358,900
Cordwood	85,355 Cords	270,380
Mine Props	109,217 Tons	261,451
Tan Bark	34,360 Tons	253,510
Staves and Headings	30,389,019 Pieces	223,931
Poles	62,135	180,042
Shingles	13,842,000	45,901
Lath	14,837,000	45,282
Mine Ties	260,000	39,000
Posts	133,645	20,587
Export Logs	529,000 Board Feet	16,130
Charcoal	95,000 Bushels	9,500
Pinwood	440 Cords	3,960
The State	46,949,181 Cubic Feet	$6,436,751


MAP OF
WORCESTER COUNTY
SHOWING THE
FOREST AREAS
BY
COMMERCIAL TYPES
PREPARED BY
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MARYLAND BOARD OF FORESTRY
WM BULLOCK CLARK
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STATE FORESTER
1915
SCALE
1 Inch equals 3 Miles or 1/187 500 of Natural Scale
FOREST SURVEY 1914
TYPES
Merchantable Hardwoods (M)
Culled Hardwoods (C)
Loblolly Pine (L)
Cypress (Cy)
Loblolly Pine Saplings (Ls)
Merchantable Hardwoods and Cypress (MCy)
Mixed Hardwoods and Loblolly Pine (CL)
Mixed Hardwoods and Cypress (CCy)
STAND OF SAW TIMBER PER ACRE IN BOARD FEET
8,000 — 12,000
4,000 — 8,000
2,000 — 4,000
1,000 — 2,000
0 — 1,000
15,000 — 25,000
5,000 — 15,000
Salisbury
Delmar
Snow Hill
Berlin
Pocomoke
Ocean City
Isle of Wight
Stockton
Girdletree
Newark
Whaleyville
Bishop
Showell
Powellville
Whiton
Colbourne
Millville
Truitt
Wango
Spence
Scotts Ldg.
Rattlesnake Ldg.
Public Ldg.
Franklin City
Cedarhall
Sinepuxent
Bethel
Atlantic

FOREST LAWS OF MARYLAND.

General Forestry.

Acts of 1906, chapter 294, "An Act to establish a State Board of Forestry and to promote forest interests and arboriculture in the State," as amended in chapter 161, Acts 1910, and chapter 823, Acts of 1914.

Section 1.—Be it enacted by the General Assembly of Maryland, That there shall be a State Board of Forestry, consisting of seven members, the Governor, Comptroller, President of Johns Hopkins University, President of Maryland State Agricultural College, State Geologist, one citizen of the State known to be interested in the advancement of forestry, and one practical lumberman engaged in the manufacture of lumber within this State; who shall be appointed by the Governor, to serve for a term of two years, which Board shall act without compensation, save for actual necessary expenses incurred in the performance of their official duties.

Sec. 2.—That there shall be appointed by the State Board of Forestry a State Forester, who shall be a technically trained forester of not less than two years' experience in professional forestry work, his compensation shall be fixed by the Board and he shall be allowed reasonable traveling and field expenses incurred in the performance of his official duties. He shall, under the general supervision of the State Board of Forestry, have direction of all forest interests and all matters pertaining to forestry and the forest reserves within the jurisdiction of the State. He shall appoint, subject to the approval and confirmation of the State Board of Forestry, such assistants and employes as may be necessary in executing the duties of his office and the purpose of the Board of Forestry; the compensation of such assistants and employes to be fixed by the State Board of Forestry. He shall have charge of all Forest Wardens in the State and aid and direct them in their work; take such action as is authorized by law to prevent and extinguish forest fires, enforce all laws pertaining to forest and woodland, and prosecute for any violation of such laws; collect data relative to forest destruction and conditions; direct the protection and improvement of State parks and forest reserves and co-operate with land owners as described in Section 4 of this Act. He shall annually de-

liver a course of lectures at the Maryland State Agricultural College bearing upon forestry and silviculture, subject to the approval of the Trustees of the College and of the State Board of Forestry, and as far as his duties as State Forester will permit, carry on an educational course of lectures on Forestry at the Farmers' Institutes and similiar meetings within the State. He shall act as Secretary of the State Board of Forestry and shall prepare for the Board annually a report on the progress and condition of State Forest work and recommend therein plans for improving the State system of forest protection, management and replacement.

SEC. 3.—That the State Board of Forestry shall have the power to purchase lands in the name of the State, suitable for forest culture and reserves, using for such purposes any special appropriation or any surplus money not otherwise appropriated, which may be standing to the credit of the Forest Reserve Fund; and to make all rules and regulations governing State Reserves, and to employ such labor and do such work as they deem wise in developing and protecting State Reserves under their jurisdiction; and that the Governor of the State is authorized upon the recommendation of said State Board of Forestry to accept gifts of land to the State, the same to be held, protected and administered by the State Board of Forestry as State Forest Reserves, and to be used so as to demonstrate the practical utility of timber culture, water conservation and as a breeding place for game. Such gifts must be absolute except for the reservation of all mineral and mining rights over and under said lands, and a stipulation that they shall be administered as State Forest Reserves, and the Attorney-General of the State is directed to see that all deeds to the State of land mentioned above are properly executed before the gift is accepted.

SEC. 4.—That the State Forester shall, upon request, under the sanction of the State Board of Forestry, and whenever he deems it essential to the best interests of the people of the State, co-operate with counties, towns, corporations, and individuals, in preparing plans for the protection, management, and replacement of trees, woodlots, and timber tracts under an agreement that the parties obtaining such assistance pay at least the field expenses of the men employed in preparing said plans.

SEC. 5.—That whenever the State Forester considers it necessary he may apply to the Governor to commission such persons as he may designate to act as Forest Wardens of this State to enforce the forest laws and to carry out all the purposes of this Act and any work that may be assigned to them by the State Forester. If the Governor approves such persons he may appoint them Forest Wardens for a term

of two years, but they shall be subject to removal at any time at the pleasure of the Governor. Such Wardens shall receive such compensation for their services as shall be fixed by the State Board of Forestry. Forest Wardens thus appointed shall, before entering upon the duties of their offices, take the proper official oath before the Clerk of the Court of the County in which they reside, after which they shall while holding said office, possess and exercise all the authority and power held and exercised by constables at common law under the statutes of this State, so far as arresting and prosecuting persons for all violations of any of the forest laws or the laws, rules and regulations enacted or to be enacted for the protection of the State forestry reservations, or for the protection of the fish and game contained therein are concerned.

SEC. 6.—That it shall be the duty of the Forest Wardens to enforce all forest laws of this State, to protect the State Forest Reserves and see that all rules, regulations and laws are enforced; to report any violation of law to the State Forester at the time of its occurrence, to assist in apprehending and convicting offenders, and to make an annual report to him as to forest conditions in their immediate neighborhood. When any Forest Warden shall see or have reported to him a forest fire, it shall be his duty to immediately repair to the seat of the fire and employ such persons and means as in his judgment seem expedient and necessary to extinguish said fire. He shall keep an itemized account of all expenses thus incurred and send such account immediately to the State Forester. He shall have control and direction of all persons and apparatus engaged in extinguishing forest fires. He may summon male inhabitants of the county between the ages of 18 and 50 years to assist in extinguishing fires, and may also require the use of horses and other property needed for such purpose. Any person so summoned who is physically able, who refuses or neglects to assist, or to allow the use of horses, wagon or other material required, shall be liable to a penalty of ten dollars. No action for trespass shall lie against a Forest Warden, or anyone working under his direction, for entering lands of individuals or corporations for the purpose of extinguishing a fire, plowing furrows, or tearing down fences, or starting a backfire to check a fire that may be approaching.

SEC. 7.—That the expenses incurred in fighting or extinguishing any fire under the direction of the State Forester, or a Forest Warden, shall be borne half by the county in which the fire occurred and half by the State, and shall first be payable in full by the County Commissioners of such county upon the receipt of an itemized account, with vouchers approved by the State Forester; the half to be paid by the State shall be refunded by the order of the State Board of Forestry

out of any moneys standing to the credit of the Forest Reserve Fund, upon presentation of the accounts, together with evidence that the County Commissioners have paid the sum in full. Nothing in this Act shall be so construed as to relieve the owner or lessee of lands upon which fires may burn, or be started, from the duty of extinguishing such fires so far as may lie within his power. No such owner or lessee, nor person in the employ of such owner or lessee, shall receive any compensation from the State, or from the county, for fighting fires upon the lands of such owner or lessee.

SEC. 8.—That the Boards of County Commissioners of the several counties of this State are hereby authorized to levy and appropriate money for purposes of tree planting and care of trees, and for forest protection, improvement, management and purchase.

SEC. 9.—That the State Forester shall furnish notices, printed in large letters upon cloth, calling attention to the dangers of forest fires, and to forest fire and trespass laws and their penalties; such notices shall be distributed by the State Forester to Forest Wardens and posted by them in conspicuous places upon the State forest reserves and along the highways in forest-covered country. It shall be unlawful for any person to tear down or deface any forest fire warning notice. Any violation of the law shall be punishable by a fine of ten dollars for each and every offense. It shall be the duty of any person who discovers a forest or brush fire not under the control or supervision of some person to extinguish it or to report it immediately to the local Forest Warden, and failure to do so shall be punishable by a fine not to exceed ten dollars, to be recovered upon complaint of the Forest Warden.

SEC. 10.—That every individual or corporation that carelessly, negligently, wilfully, maliciously, or with intent sets on fire, or causes or procures to be set on fire any woods, brush, grass, grain or stubble on lands not their own, shall be guilty of misdemeanor, and upon conviction be punishable by a fine of not less than $25 or more than $1,000 or imprisonment for not less than thirty days or more than one year, or both such fine and imprisonment.

SEC. 11.—That it shall be unlawful for any person or corporation as land owner to set, or procure another to set fire to any woods, brush, logs, leaves, grass or clearing upon their own land, unless they shall have previously taken all possible care and precaution against the spread of such fire to other lands not their own, by previously having cut and piled the same, or carefully cleared around the land which is to be burned, so as to prevent the spread of such fire. The setting of fire contrary to the provisions of this Section, or allowing it to escape to the injury of adjoining lands shall be prima facie proof of wilful-

ness, or neglect, and the land owner from whose land the fire originated shall be liable in a civil action for damages for the injury resulting from such fire, and also for the cost of fighting and extinguishing the same.

SEC. 12.—That logging and railroad locomotives, donkey and threshing engines and other engines and boilers operated in, through or near forest or brush, which do not burn oil as fuel, shall be provided with appliances to prevent the escape of fire and sparks from the smoke-stacks thereof, and with devices to prevent the escape of fire from ash pans and fire-boxes. Failure to comply with these requirements shall be a misdeamor, punishable upon conviction by a fine of not less than $10 nor more than $100 for each and every offense thus committed.

SEC. 13.—That all individuals or corporations causing fires by violations of Sections 10, 11 and 12 of this Act shall be liable to the State, and to the county in which the fire occurred, in an action for debt to the full amount of all expenses incurred by the State or county in fighting and extinguishing such fire.

SEC. 14.—That Justices of the Peace for this State in the county wherein the offense shall have been committed shall have jurisdiction to hear and determine all prosecutions for the purpose of enforcing fines and penalties collectible under the provisions of this Act, not exceeding the amount of $100, and of holding the offenders under proper bail if necessary, for hearing before the Circuit Court, commiting them to the county jail until such hearing, if the required bail is not furnished. It shall be the duty of the State's Attorney of the several counties to prosecute all violators of Section 10 of this Act.

SEC. 15.—That all money received as penalties for violations of the provisions of this Act, less the cost of collection, and not otherwise provided for, together with any amount obtained from the State Forest Reserves, shall be paid into the State Treasury to the credit of the Forest Reserve Fund, which fund is hereby created, and the moneys in said fund are hereby appropriated for purposes of forest protection, management, replacement and extension, under the direction of the State Board of Forestry.

SEC. 16.—That the State Board of Forestry shall have the right and power to condemn lands, earth, gravel, stone, timber or materials, or any improvements in the name of the State, under Article 33-A, title "Eminent Domain" of the Code of Public General Laws of Maryland as passed in Chapter 117 of the Acts of 1912 when such action is necessary for carrying out the purposes of any Legislative Act, or for advancing the aims of forestry, and the work of the State Board of Forestry, and they may pay all costs and expenses thus in-

curred out of any surplus moneys standing to the credit of the Forest Reserve Fund, not otherwise appropriated; nothing herein contained shall apply to the City of Baltimore.

SEC. 17.—That all acts or parts of acts inconsistent with the provisions of this Act are hereby repealed.

ROADSIDE TREE LAW.

Acts of 1914, Chapter 824, "An Act conferring power upon the State Board of Forestry to plant trees along the roadsides, to protect roadside trees, to establish one or more nurseries for their propagation, to prohibit the unauthorized placing of advertisements and other notices on the public highways or the property of other persons, and to provide a penalty for the violation thereof," as amended in Chapter 548, Acts of 1916.

SECTION 1.—The State Board of Forestry shall, in addition to the powers heretofore granted it, have the power to plant trees along the roadsides, to make all rules and regulations governing their planting, to care for and protect all roadside trees of this State, and to establish one or more State Forest Nurseries for the propagation of trees for such roadside planting.

SEC. 2.—Roadside trees as designated in this Act shall mean all trees planted by the Forest Wardens, or existing trees three inches or more in diameter, measured two feet from the ground, that may be growing within the right-of-way of any public road or between the curb lines and property lines of any street in an incorporated town in this State.

SEC. 3.—When the County Commissioners or the Road Supervisors of any county of this State, the State Roads Commission, the Town Council of any city or incorporated town, or any organization or person, shall apply to the State Forester for the planting of trees or for the care and protection of existing trees along a public road or street, and the State Forester deems an examination necessary, he shall instruct the local Forest Warden to examine the situation where planting, care or protection of trees is desired and to report the conditions with his recommendations to the State Forester. If, in the judgment of the State Forester, the planting of trees or the care or protection of existing trees is advisable, he shall submit a plan covering the required operations with his recommendations and an estimate of the cost of the work to the organization or persons from which the application originated.

SEC. 4.—No plan of planting or care of roadside trees shall become operative under this Section until such plan has been approved by the organization or person making the application and not until the said organization or person shall guarantee to the State Forester the cost of the work, in which the said organization or person may stipulate a maximum amount that it or he will guarantee. Upon proper assurance that such a guarantee has been given, and the planting of trees is desired, the State Forester shall furnish to the local Forest Warden the trees for planting from any available stock in a State Forest Nursery or elsewhere. If the planting of trees is not required, but it is desired to trim, spray or otherwise care for existing trees along the portion of the roadside or street for which a plan has been approved by the State Forester and accepted by such organization or person, the Forest Warden shall proceed with the work in accordance with such plans, at such time and in such manner as in his judgment will be most practicable, but in executing such plans he shall work under the direction of the State Forester. When there exists an officer in any city or incorporated town who has been appointed for the specific purpose of planting and caring for trees along the roads or streets, he shall be eligible for appointment as Forest Warden in carrying out the provisions of this Act.

SEC. 5.—The State Forester may, in his discretion, without being requested as provided in Section 3 hereof, or guaranteed as provided in Section 4 hereof, plant, care for and protect roadside trees and pay for such work out of any unexpended balance of the amount hereby appropriated or hereafter appropriated for the purpose of this Act; provided, however, that no trees shall be planted under the provisions of the foregoing sections without the consent and approval of the owner of the land on which they are planted.

SEC. 6.—It shall be the duty of the Forest Wardens and others having police powers in this State, in addition to the duties heretofore imposed, to enforce all laws now enacted or that may be enacted for the care and protection of roadside trees, and, while holding said office, they shall possess and exercise the power to arrest, without warrant anyone detected by them in the act of violating any law for the protection of roadside trees, and take such persons before a peace officer having jurisdiction.

SEC. 7.—For his services in making examinations as provided in Section 3 of this Act, the Forest Warden shall be paid by the State Board of Forestry upon presentation of his accounts with vouchers, approved by the State Forester, and for services in planting roadside trees, trimming, spraying, or otherwise caring for existing roadside trees as provided in Section 4 of this Act, the Forest Warden and the

helpers he may be authorized to employ shall be paid by the organization or person guaranteeing the cost of the work upon presentation of the Forest Warden's accounts with vouchers, approved by the State Forester and for his services in examining conditions when permits are applied for under Section 8 of this Act issuing permits, and supervising the work authorized by such permits, he shall be paid by the person or corporation applying for this permit. The rates to be paid under this Section shall be determined by the State Board of Forestry.

SEC. 8.—Any person or persons who may desire to cut down or trim any roadside tree shall make application to the State Board of Forestry for a permit, except in the two following cases: (1) That where trees are uprooted or branches of trees broken in such manner that they shall come in contact with telephone, telegraph, electric light or other wires carrying electric current, or where such trees or branches shall endanger persons or property, such trees or branches of trees as the case may be, may be removed in such an emergency without first obtaining a permit from the State Board of Forestry, and (2) that trees standing within the right-of-way of unimproved public roads which have not been surfaced with either stone, shell, gravel, concrete, brick, asphalt or other improved surface may be cut down and removed by the abutting land owner for his own use without first obtaining a permit.

Any person or persons who shall cut down, trim, mutilate or in any manner injure any roadside tree, except as provided for in this section, without a permit from the State Board of Forestry or its duly authorized representative, shall be guilty of a misdemeanor, and upon conviction shall be punishable by a fine of not less than five dollars or more than fifty dollars for each offense, which fine shall be payable to the State Board of Forestry for the purposes described in this Act.

SEC. 9.—Any person who in any manner paints, puts or affixes any advertisement, sign, notice or other written or printed matter, other than notices posted in pursuance of law, on or to any stone, tree, fence, stump, pole, building or other structure which is in or upon a public highway, or which is on the property of another, without first obtaining the written consent of such owner thereof, shall be guilty of a misdemeanor and upon conviction shall be punishable by a fine of not more than ten dollars, which fine shall be payable to the State Board of Forestry for the purposes described in this Act.

SEC. 10.—Any tree grown in the State Nurseries not required for roadside planting may be used for planting on the State Forest Reserve or may be furnished to any land owner of this State at not less

than the cost of production; provided such trees shall be planted according to plans approved by the State Forester.

SEC. 11.—That all Acts or parts of Acts inconsistent with the provisions of this Act are hereby repealed.

PATAPSCO RESERVE.

Acts of 1912, Chapter 749, as amended in Chapter 209, Acts of 1914, "An Act to empower the State Board of Forestry to purchase lands on the watershed of the Patapsco River for a State Forest Reserve."

SECTION 1. Be it enacted by the General Assembly of Maryland, That the State Board of Forestry in addition to the powers heretofore granted it is empowered to purchase lands on the watershed of the Patapsco River for a State Forest Reserve at such prices as they may determine it to be worth, within the appropriation hereunder made, the same to be paid for out of the funds appropriated by this Act, to be held by the State as a State Forest Reserve, under the protection and administration of the State Board of Forestry, which shall exercise the same power in the matter of making rules and regulations in the management thereof as other State Forest Reserves are now subject to or may hereafter be subjected to. The territory which may be acquired hereunder shall be subject to all the general laws heretofore passed by the Legislature of the State not inconsistent herewith, but acts inconsistent with the provisions of this Act are hereby repealed.

SEC. 2. And be it enacted, That this Act shall take effect from the date of its passage.

(The sum of $50,000 was appropriated for the purposes described in Section 1.)

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