

.. State of New Hampshire ..

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Biennial Report

OF THE

Forestry Commission

FOR THE

YEARS 1911-12

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CONCORD

NOVEMBER, 1912

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## REPORT.

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*To His Excellency the Governor and the Honorable Council:*

The biennial report herewith submitted in accordance with Section 2, Chapter 166, Laws of 1911, covers the two fiscal years from September 1, 1910, to August 31, 1912. It sets forth the progress made in state forestry work during these two years, and an itemized statement of the financial transactions of the Forestry Commission. The forest laws now in force and a list of the forest fire wardens and deputies is printed in the appendix.

The legislature of 1911 passed laws which extended the scope of forestry work in providing more fully for fire protection and education, in establishing a state forest nursery and providing for the acquisition of state land. The system of town forest fire wardens, established in 1909, was strengthened by the addition of four district chiefs to supervise all fire protective work. The law further enabled the state to take over and operate the mountain lookout stations established by the timberland owners, and to employ patrolmen and do other necessary work to prevent fires.

The work of the Forestry Commission has also been strengthened by coöperation with the Federal Forest Service, the New Hampshire Timberland Owners' Association, and the Society for the Protection of New Hampshire Forests. The Forest Service under the Weeks Act has provided New Hampshire with twenty-four patrolmen, employed during the fire seasons of 1911 and 1912, and through its Office of Forest Products has made a detailed investigation of the wood-using industries of the state. The New Hampshire Timberland Owners' Association has employed additional pa-

trolmen, built lookout stations, provided fire fighting tools, and performed other protective work which the state and government could not undertake. The Society for the Protection of New Hampshire Forests has continued its excellent educational work throughout the state, has acquired several forest reservations, and was largely instrumental in securing the legislation for state acquisition of the Crawford Notch.

The commission held meetings monthly when necessary for the transaction of business, and at shorter intervals during seasons when fire protection or other important measures demanded frequent consultation. Prior to the meetings of April and November, the state forester prepared budgets respectively for summer and winter activity, outlining in detail the work proposed for each branch of the service and estimating the cost of each operation. The commission then made such corrections as seemed advisable, and the budget then became the working basis for the season. This plan greatly facilitated the consideration of questions arising at subsequent meetings. All old budgets are filed for use in estimating the time and cost of different operations.

It is the aim of this report to show how the forestry laws have operated, the progress that has been made since the new laws took effect, and how the state work has been supplemented by that of the towns, the government, associations and individuals. It also considers and summarizes for each branch of the service the conditions and requirements which the law is inadequate to meet, and the measures that should be taken to improve the service.

W. R. BROWN,  
JASON E. TOLLES,  
ROBERT E. FAULKNER,  
*Forestry Commission.*  
E. C. HIRST,  
*State Forester.*

LETTER FROM MR. GEORGE B. LEIGHTON UPON HIS RETIREMENT AS FORESTRY COMMISSIONER ON MAY 1, 1912.

*To the Members of the Legislature of 1913:*

My term of office expiring May 1, 1912, there seems to be no opportunity to convey to the legislature such observations as seem pertinent to the work of the Forestry Commission for the biennial report except in this way.

The commission has held meetings monthly during my term of office. The state forester is deeply interested in the work, but he has had a large amount of extra work on account of his dual capacity as state forester and representative of the Federal Government in the fire protective work in the White Mountains. Such a condition should not continue indefinitely because the other problems of forestry are of necessity neglected. Fire protection is one of the essentials of the state forestry policy, but it is by no means the only one. The laws and inducements to reforest suitable lands are not as advanced as those of Massachusetts and little is being done in this work except by a few people of their own incentive. A helpful and a stimulating law is much needed.

Our system of forest taxation is under consideration. It is clear to those who have studied the question that the only time to tax the forest crop to any extent is when it goes to market. A small tax per acre might be made of say a valuation of two dollars an acre if covered with merchantable timber, but the real tax must come only when cutting is made. At present the tax laws work distinctly for deforestation, as an owner is inclined to cut his timber as soon as it is merchantable for, if he pays a considerable annual tax the cost not only mounts



up but there is a chance that he may lose the whole by fire. The selectmen can appraise and collect tax on any lot being cut.

Portable mills should be taxed sufficiently to employ an inspector who can see that they observe the laws and regulations that are made concerning them.

The commission has been unable to devote time to the study of the utilization of the forest waste left by the portable mills and in cutting, owing to the demands of the fire protective service. This question is important, for the aggregate waste is great and if but partially obviated, would more than reimburse forest owners for any tax.

Throughout our state there are vast opportunities for water conservation which would enable the mills to have a more permanent water flow during the summer. The commission should be empowered to make a survey and submit a report on this question. Whether it will be wise to enter upon a policy, already in effect in New York, of actually doing this work can then be determined.

New Hampshire has the opportunity of making a state forest in several localities. Particularly is this so in the hill country of Cheshire, Sullivan and Hillsborough counties. A vast tract is here of little value and will continue so, but it could be far otherwise and employment given to many at small outlay, with eventually a profit, if a state forest could be created. A paper on this subject, read at the White Mountain Forest Meeting, in August, 1911, is herewith submitted and made part of this report.

My relations with the commission and with the state forester have been most cordial, and I hope they may be given additional opportunities to render faithful service to the state.

Respectfully submitted,  
GEORGE B. LEIGHTON.

April 10, 1912.

## THE FOREST FIRE SERVICE.

### DISTRICT ORGANIZATION.

North District: F. M. Hancock, District Chief, Milan.

\*East District: Wm. Wyman, District Chief, Intervale.

†East District: W. H. Morrison, District Chief, North Conway.

West District: E. M. Clark, District Chief, Pike.

South District: J. J. McNulty, District Chief, Concord.

In compliance with the law of 1911, the state was divided into four fire districts, as shown on the accompanying map. The district areas were decided upon from the standpoint of the amount of work to be done in different parts of the state, and the transportation facilities determining the territory which each man could supervise.

The appropriation was insufficient to pay the legal rate of three dollars per day and expenses for the four district chiefs appointed. Furthermore, it was found that men capable of supervising the work in a district could not be secured for three dollars per day. The New Hampshire Timberland Owners' Association furnished the extra funds necessary to carry on the district supervision. During 1911, the state paid the district chiefs two dollars per day, and in 1912, three dollars per day and necessary expenses for each day of actual service. The New Hampshire Timberland Owners' Association paid them two dollars per day in 1911, and one dollar per day in 1912.

\* Resigned April, 1912.

† Appointed May, 1912.

The work done by the district chiefs has welded the forest fire activities of the state and the towns into a more efficient organization. They visited the towns, interviewing the forest fire wardens, the selectmen, woodland owners, and others interested in forest protection, and helped the town warden to secure good deputies in different sections of the town, and advised the boards of selectmen in regard to the purchase of fire fighting tools and apparatus.

An important duty of the district chiefs was to supervise construction and operation of mountain lookout stations, and the work of patrolmen paid by the state, the government, or timberland owners. In sections not under observation from lookout stations, the district chief generally arranged with some person living on high ground to telephone the location of fires discovered to the nearest forest fire warden or deputy. The patrolmen and watchmen sent reports of their work to the district chief, the latter making a daily, weekly, and monthly report to the state forester. Another duty of the district chiefs is to take personal charge of large fires which burn in two or more towns, help the fire wardens in securing and directing the fire fighters, and adjusting the expenses between the towns after the fire is extinguished.

The increased field force of patrolmen and lookout watchmen provided by the Federal Forest Service and the New Hampshire Timberland Owners' Association greatly increases the need of field inspection. It would be impossible to make the present law effective, and to efficiently coordinate the state, federal, and private work without the close field supervision which the district chiefs can give.

## MOUNTAIN LOOKOUT STATIONS.

## CONSTRUCTION AND ACQUISITION.

The law of 1911 provided for the acquisition and operation by the Forestry Commission of the mountain lookout stations which had been established, and for the construction and maintenance of additional stations. In compliance with this act nine stations, which had been built and operated during the previous two years by private subscription, were taken over and have since been operated by the state. On four stations where telephone lines have been maintained for several years, for this and other purposes, it was not found advisable to purchase the equipment, but arrangements were made for the use of the stations as lookouts. Six other stations were constructed by the commission, five of them for use temporarily during very dry weather. Stations that overlook parts of New Hampshire are now operated by Maine, Massachusetts and Vermont. A number of fires have been reported from these lookouts to the wardens in New Hampshire. Fires outside the state discovered from New Hampshire stations are likewise reported to wardens in the other states.

During the fall of 1911 six new stations were constructed by the New Hampshire Timberland Owners' Association. No state funds were available for the acquisition or maintenance of these stations. They were operated throughout the summer of 1912 by federal men under the agreement with the Forest Service, which is considered in detail on pages 20-24.

The following is a list of the stations being operated at the present time:

## LIST OF LOOKOUT STATIONS AND WATCHMEN.

Mountain	Watchman	P. O. Address	Exchange Telephone
Deer <sup>a</sup> .....	Clarence Wheeler ...	Pittsburg, Second Lake....	Pittsburg.
Magalloway .....	Joshua Farnsworth ..	Pittsburg .....	Pittsburg.
Dixville* .....	Benson P. Wilkins..	Dixville Notch....	Colebrook.
Sugar Loaf .....	John Ryan .....	Groveton .....	Groveton, Odell Co.'s Ex.
Signal .....	F. G. Jipson.....	Errol .....	Erroll.
Black .....	E. C. Stiles.....	Milan .....	Milan.
Cabot* .....	Frank C. Leavitt..	Lancaster .....	Lancaster.
Pine .....	Archie Twitchell ...	Gorham .....	Gorham.
Madison .....	Paul Haynes .....	Gorham .....	Gorham.
Carrigain† .....	David Murray .....	Livermore .....	Livermore Mills Co.
Kearsarge† .....	W. H. Seavey.....	Kearsarge .....	North Conway....
Chocorua* .....	S. E. Metcalf.....	Silver Lake .....	Mudgett's Mill, Tamworth.
Rosebrook .....	George Underhill ..	Bretton Woods...	Bretton Woods.
Agassiz .....	W. S. Phillips.....	Bethlehem .....	Bethlehem.
Black* .....	Herman Morrill ...	Pike .....	Pike.
Moosilauke .....	Maurice French .....	Breezy Point.....	Warren.
Osceola .....	C. B. Shiffer.....	Waterville .....	Campton.
Stinson* .....	Fred Ford .....	Rumney .....	Rumney.
Croydon .....	Carroll S. Gross...	Croydon .....	Newport.
Monadnock† .....	.....	.....	East Jaffrey.

## TEMPORARY LOOKOUT STATIONS.

Beech Hill, Keene.  
 Federal Hill, Milford.  
 Uncanoonuc Mountain, Goffstown.  
 Teneriffe Mountain, Milton.  
 ‡Crary Hill, Henniker.

## OPERATION.

During 1911 and 1912 the lookout service increased markedly in efficiency. Most of the stations were established and began operations in 1910. Many of the watchmen have been employed on the same stations in

\* Watchmen paid by Federal Government from coöperative fund under the Weeks Act. Stations equipped by New Hampshire Timberland Owners' Association.

† Stations owned by state of New Hampshire and operated in 1911 by the Federal Government under the Weeks Act.

‡ Stations built in 1912.

succeeding seasons, and have thus become better acquainted with their duties and the territory they survey. It should be remembered in this connection that there has been more dry weather in the two latter years than in 1910, and hence more fires for the watchmen to report. The greater number of stations also allow fewer places where fires can start and escape discovery. This is especially true in the northern part of the state, which is now fairly well covered by lookouts. The absence of such protection was keenly felt in southern New Hampshire during the extremely dry summer of 1911.

There were fifteen stations operated in 1911, three of them used only temporarily during very dry weather, on an average of twenty-five days for the season. The other twelve were operated on an average of one hundred and twenty-five days. From these fifteen stations one hundred and forty-four fires were discovered and reported to the forest fire wardens.

In 1912, there were twenty-four stations in operation, six of which were operated temporarily for an average of twenty-five days, and eighteen being operated an average of one hundred and twenty-five days for the season.

The following table summarizes the lookout work in the different districts:

#### SUMMARY OF LOOKOUT OPERATIONS BY DISTRICTS.

1911.	North District.	East District.	West District.	South District.	Total.
Number of stations operated	6	2	4	3	15
Number of fires reported....	54	15	46	27	142
1912.					
Number of stations operated	9	5	6	4	24
Number of fires reported....	57	41	66	14	178

## EXTENSION AND IMPROVEMENT.

From the experience of the past three years it is evident that the mountain lookout stations have been of great service in preventing fires, and the extension of this service throughout the state should proceed in a systematic manner, as rapidly as is consistent with the improvement and maintenance of the present stations. By acquiring the stations recently constructed by the timberland owners, the state would have enough stations in operation to cover the northern part very thoroughly. But there would still be considerable areas in the central and southern part left unprotected.

The plan adopted for the extension of the lookout service should recognize the value of high and low stations in different kinds of weather. Experience has demonstrated that the very highest mountains are not the best for the discovery of fires on account of the greater number of days when the high peaks are cloud-capped, also the amount of haze in the air through which the observer looks increases with altitude and distance, and makes the discovery of fires more difficult. In ordinary weather mountains of medium height give good service. The present stations, with five or six more in the central and southern part of the state, would constitute a system of primary stations from which almost any fire in the state would be discovered in clear weather. In periods of extreme drought, especially after fires have started, the radius of vision from these higher lookout stations is considerably reduced. For such times secondary stations should be operated on lower mountains or hills to cover the country between higher stations. These secondary stations need not be operated throughout the summer, but only temporarily during times of extreme fire danger. Such a system, supplemented by the large number of places where arrangements have been made for reporting fires from persons living at natural lookout points, will give very efficient service.

While the lookout system is being extended it should be also improved. The telephone service is not always certain where the lookout line enters a private house, and the message must be repeated. Wherever possible the lines should be extended to connect with the local telephone exchange. To connect all the lookout stations directly with telephone exchanges would, at present, incur considerable expense in the payment of rentals. The commission has not yet been able to secure telephone exchange connections at less than the yearly rental. Inasmuch as the lookout service is for only about six months, such expense was not warranted. It is hoped, however, that an arrangement can be made for exchange service at a lower figure, and the speed of reporting incipient fires thereby greatly increased.

Next to the telephone line the most important equipment for a lookout station is a good map of the surrounding country. The making of accurate maps that are of real service in locating fires requires considerable time and expense, and the commission has carried forward this work as far as its funds would permit. The most useful map is one which shows not only the surface of the country, but a panorama of the hills and valleys as they appear to the observer. Such a map is the one of Pine Mountain, shown on the accompanying diagram. This map was made by Professor Frederick B. Knapp of Duxbury, Mass., and presented to the New Hampshire Forestry Commission as a model for fire lookout purposes. Since then the commission has made similar maps for seven other stations, and is constructing others as far as funds are available. On the stations where these maps have been used, the service has been markedly benefited.



## COOPERATION WITH THE UNITED STATES FOREST SERVICE.

### FEDERAL AID IN FIRE PROTECTION.

New Hampshire was the first state to benefit by the coöperative fire protection fund provided in Section 2 of the Weeks Act. By this law two hundred thousand dollars was appropriated on March 1, 1911,

to enable the Secretary of Agriculture to coöperate with any state or group of states, when requested to do so, in the protection from fire of the forested watersheds of navigable streams; . . . . Provided that in no case shall the amount expended in any state exceed in any fiscal year the amount appropriated by that state for the same purpose during the same fiscal year.

The Forestry Commission made application to the Secretary of Agriculture soon after the passage of the above act, and on June 4, 1911, an agreement went into effect whereby the state was allowed seven thousand two hundred dollars for employing patrolmen in the mountain region during the fire season of 1911. The agreement was renewed in 1912, and the allotment was increased to eight thousand dollars. To carry this agreement into effect the state forester and the forester for the New Hampshire Timberland Owners' Association are appointed Collaborators in the Forest Service for the purpose of supervising the federal men. During 1911 all the men were employed for patrol work, but in 1912 six of them were used on lookout stations.

### THE WORK OF THE FEDERAL PATROLMEN.

The most important duties of the patrolmen when covering their routes were putting out small fires, warning persons they met about fire danger, and recording the names of parties going into the woods. During 1911, sixty-nine such fires were extinguished, and up to August 31, 1912, fifty fires.

The patrolmen were instructed to warn persons found in the woods about the danger from fire, inform them about the laws, record the names and addresses of such people and forward such names to the district chiefs. The educational value of such work is incalculable. During 1911, four thousand seven hundred warnings were issued, and up to August 31, 1912, about two thousand five hundred warnings. This would indicate that many people have been restrained who otherwise might have caused fires through carelessness. In many instances during dry weather, when the patrolmen interviewed camping and fishing parties and recorded their names, the parties abandoned their plans, not with much protesting, but simply not wishing to be held responsible for a fire caused by some careless person. It is the plan of the commission to catalogue these names recorded by the patrolmen and mail copies of the fire laws to them. It is hoped that in this way each year a greater proportion of the people who come into the woods will have respect for the law and knowledge that the timberlands are being patrolled.

In addition to the regular duties, the improvement work done by the patrolmen will each year make the territory easier to protect and render their work more efficient. During the two field seasons they helped in the construction of 50 miles of telephone line, built or fixed 15 camps for temporary headquarters, brushed out 50 miles of old trails and cut 70 miles of new trails.

The original appropriation made for coöperative fire protection under the Weeks Act will be exhausted this year. It is earnestly hoped that Congress will make an annual appropriation so this work can be continued.

## LIST OF FEDERAL PATROLMEN. (1912.)

## NORTH DISTRICT.

NAMES AND ADDRESSES.	PATROL.
H. S. Lord, Pittsburg, N. H.	Pittsburg—Indian Stream and Perry Stream.
Horace Wright, Pittsburg, N. H.	Pittsburg—Second Lake and trail to head of Diamond Stream.
Charles Lord, Pittsburg, N. H.	Clarksville—Cedar Stream and Diamond Ponds.
Herbert Fickett, Went- worth's Location, N. H.	Dartmouth Grant—Dead Diamond and Four Mile Brook.
H. G. Higgins, Went- worth's Location, N. H.	Dixville—Swift Diamond Stream, Diamond Ponds to Four Mile Brook.
George Maxwell, Errol, N. H.	Millsfield—Ponds, Railroad and Clear Stream.
Henry Downing, Grove- ton, N. H.	Odell—Nash Stream.

## WEST DISTRICT.

NAMES AND ADDRESSES.	PATROL.
Allen C. Ayer, Bethlehem, N. H.	Bethlehem and Franconia—Gale River and tributaries
J. E. Brown, Woodstock, N. H.	Woodstock—Lost River and El- bow Pond.
Josiah Stevens, Johnson, N. H.	Lincoln—Franconia Notch, Bog Pond and Flume Brook.
F. W. Harsthorn, Twin Mountain, N. H.	Bethlehem and Carroll—Little River, Zealand River, and Cherry Mountain Brook.
John B. Merrill, Warren, N. H.	Warren and Benton—Head of Baker River.
Victor A. Brooks, Benton, N. H.	Benton—Head of Wild Ammonoosuc, Kinsman Notch, Tunnell Brook, Whitcher Brook, and Long Pond.

## EAST DISTRICT.

NAMES AND ADDRESSES.	PATROL.
Thomas W. Croly, Glen N. H.	Jackson and Sargent's Purchase— Rocky Branch, Ellis River and Miles Brook.
Daniel Dinsmore, Inter- vale, N. H.	Jackson and Chatham—East Br. of Saco River, Slippery Brook, Burnt Knoll Brook.
Frank Harriman, Passa- conway, N. H.	Albany and East Waterville—Old Lumber Railroad, and streams flowing into Swift River in West Albany and East Waterville.
Ernest Osgood, Inter- vale, N. H., R. F. D.	Jackson, Bean's Purchase—Wild River.
Stephen Philbrook, Tam- worth, N. H.	Tamworth and Albany—Brooks flowing south from Mts. Paugus and Chocorua, and trails in South Albany.
L. P. Martin, Whiteface, N. H.	Sandwich—Black Mountain to Guinea Pond, Head of Beebe River and Sandwich Notch Road.

## RURAL MAIL CARRIERS TO REPORT FOREST FIRES.

An agreement was made this year between the United States Department of Agriculture and the Post Office Department, requiring rural mail carriers to report forest fires. Star route contractors and carriers are also requested to report fires.

By the terms of the agreement any rural carrier who discovers a fire is to report it to the nearest warden, deputy warden, or patrolman along his route; or, if no fire official lives along his route, to arrange through some responsible person to have the nearest official notified by telephone if possible.

This agreement was brought to the attention of the Forestry Commission by the United States Forest Ser-

vice with instructions as to how it should proceed. The commission has complied with the suggestions by sending letters to New Hampshire postmasters and furnishing pamphlets with lists of the wardens, deputies and patrolmen, to the carriers. The agreement has not been in effect long enough to show what its real value will be, but the commission believes it will be of material benefit, as the rural carriers cover many miles of country and will perform part of the services of fire patrolmen.

## COOPERATION WITHIN THE STATE.

### NEW HAMPSHIRE TIMBERLAND OWNERS' ASSOCIATION.

In the summer of 1910, there was established between the Forestry Commission and a number of timberland owners of Northern New Hampshire an agreement whereby these owners furnished funds for building and operating a number of mountain lookout stations, and the state forester supervised the work. Growing out of this coöperation the New Hampshire Timberland Owners' Association was organized the following winter, representing an ownership of about one million acres. Each member is assessed one cent per acre per year and the funds used for fire prevention. The association employed Mr. F. H. Billard, a graduate of the Yale Forest School, as secretary and forester to supervise all field work, coöperate with the state forester, and properly coördinate the work of the association with the state and federal work.

During the fire seasons of 1911 and 1912, the association has employed a large number of patrolmen, placed caches of fire fighting tools in places where they will be useful in case of fire, built telephone lines and lookout

stations, improved trails and camps, and in every way admirably supplemented the work of the Forestry Commission. The patrol work of the association has been particularly effective. They have kept seven men employed each season from about April 15 to November 1. This force has been augmented whenever dry weather made more patrol advisable. During the extreme drought in the spring of 1911, before the agreement was made with the Forest Service for federal patrolmen, the association had a large force of men at work patrolling fishing streams, railroads and other places of fire danger. Thirty-four towns have benefited by their patrol service. In most of these the plan has been to employ one or more patrolmen during dry weather and to double the force on Sundays and holidays.

The combination of tools supplied in the caches has proved most useful. Twenty-one of these have been placed, and have served not only for fighting purposes, but to show the town wardens and selectmen the best kind of tools to purchase for fire fighting. As a result, a number of towns have purchased one or more of these tool boxes.

The association has constructed six new mountain lookout stations, located on Deer Mountain, near the Canadian line in Pittsburg; Dixville Peak, south of Dixville Notch; Cabot Mountain in Kilkenny; Black Mountain in Benton; Stinson Mountain in Rumney; and Mount Chocorua. They have also built a number of telephone lines to points which the federal patrolmen and their own men reach in covering their routes. This has greatly increased the efficiency of the patrol service. In all, the association has built about fifty miles of telephone line. A classified account of their field operations follows.

FIELD FORCE OF NEW HAMPSHIRE TIMBERLAND OWNERS'  
ASSOCIATION.

PERMANENT PATROLMEN.

*Name.*            *Post-office.*

1. H. W. Fowler, Berlin. Telephone line incomplete. Route: Success Pond, fishing brooks in vicinity and road to Berlin. This man is equipped with motor cycle.
2. Fred Keough, Gorham. No telephone. Route: Boston & Maine Railroad, Gorham to Appalachia.
3. H. U. Oleson, West Milan. Telephone, care of S. Lockhart, W. Milan. Route: Upper Ammonoosuc Valley in Milan and Berlin.
4. George E. Getchell, Crystal. No telephone. Route: Phillips Brook Valley.
5. A. L. Bowker, Errol. Telephone, Berlin Mills Company's private line. Route: Millsfield ponds, logging railroad, Pond Brook, and Clear Stream.
6. Jos. F Perrault, Milan. Telephone, Black Mt. fire station. Route: Chickwolnepy and Bog Brook, and old cuttings in Cambridge.
7. Ira C. Beecher, Errol. No telephone. Route: Molnichwock Stream and area recently cut over in Errol.

EMERGENCY PATROLMEN.

In addition to the seven permanent patrolmen listed above, forty men have been employed for shorter periods in the towns listed below. In most of these towns the force has been doubled on Sundays and holidays.

*Coös County.*—Berlin, Carroll, Clarksville, Dummer, Errol, Gorham, Jefferson, Milan, Pittsburg, Randolph, Shelburne, Stark, Stratford, Cambridge, Dix's Grant, Dixville, Low and Burbank's Grant, Millsfield, Odell, Success, Sargent's Purchase, Pinkham Grant.

*Carroll County.*—Albany, Bartlett, Jackson.

*Grafton County.*—Benton, Campton, Dorchester, Warren, Livermore, Waterville, Lyme, Woodstock, Thornton.

## TOOL BOXES.

The association has furnished to the following towns a weatherproof tool box containing fire-fighting tools:

Albany, Bartlett, Stratford, Benton, Jackson, Berlin, Dummer, Errol, Gorham, Milan, Pittsburg (2), Shelburne, Haverhill; Livermore, Waterville, Woodstock, Dartmouth College Grant (2), Dixville, Wentworth's Location.

These boxes contain the following tools:

12 galvanized iron pails, 12 shovels, 12 grub hoes, 12 garden hoes, 6 axes.

## TELEPHONE LINES BUILT ON PATROL ROUTES.

1. From New England Company's Woodsville line to Wildwood for patrolmen covering route in Benton and Easton.
2. From patrolman's camp on Gale River to the line connecting with the Bethlehem Exchange.
3. From patrolman's camp on the Upper Ammonoosuc to the store of H. S. Lockhart, deputy warden at West Milan.
4. From patrolman's camp at Dummer Pond to the Pontook house, the residence of Owen Crimmins, warden of Dummer.
5. From the patrolman's camp at Success Pond to line connecting with the Milan Exchange.
6. From Milan line up Bog Brook (Cambridge).
7. From West Milan line up Phillips Brook to its forks.
8. From Pittsburg line up Indian Stream to its forks.

## ADDITIONAL FIRE PREVENTION WORK.

In addition to the operation of lookout stations and the supervision of the fire organization, the Forestry Commission has carried on to a limited extent coöperation with twenty-eight towns in central and southern New Hampshire in the prevention of fires. This work is provided for in Section 26 of the forestry law which authorizes the Forestry Commission to establish stations for fire-fighting tools, construct maps, build fire trails



and fire lines and employ patrolmen. Fifteen hundred dollars was appropriated for this purpose, and most of it used for the construction of lookout maps and employing patrolmen.

#### TEMPORARY PATROLMEN.

The fund appropriated for this purpose has permitted the commission to employ men temporarily in times of extreme fire danger and in places where fires are most likely to occur. The table below shows the number of days state patrolmen were employed in the different towns during 1911-12, the fires they extinguished, and the number of cautions given to persons travelling through the woods. The educational value of this work has been considerable. It has rendered the same service in a small way in the southern part of the state that the federal patrolmen have rendered in the north. In all, 192 fires were extinguished or reported to the forest fire wardens, and 1,290 cautions were given.

TABLE II.  
WORK OF TEMPORARY STATE PATROLMEN.

NAME OF TOWN OR CITY.	No. Patrol Days.	Fires Reported or Extinguished.	Cautions Given.
Alton .....	28½	2	100
Amherst .....	10	.....	.....
Auburn .....	18	7	8
Barnstead .....	2	.....	.....
Barrington .....	2	.....	15
Brookline .....	2	.....	.....
Chester .....	6	3	15
Concord .....	42½	16	219
Franklin .....	12	16	12
Hollis .....	2	.....	.....
Hooksett .....	35½	11	53
Hudson .....	8	.....	10
Laconia .....	61	33	109
Litchfield .....	7	1	36
Manchester .....	52	34	55
Mason .....	4	.....	.....
Merrimack .....	12½	.....	25
Milford .....	19	5	100
Mount Vernon .....	9	.....	10
Nashua .....	8	7	5
Newbury .....	17½	8	85
New Ipswich .....	4	6	85
Plaistow .....	16½	10	12
Salem .....	3	12	12
Strafford .....	4	.....	.....
Unity .....	21	1	314
Warner .....	8	14	75
Windham .....	17½	6	10
Total .....	422½	192	1,290

#### COOPERATION WITH BOY SCOUTS OF AMERICA.

Coöperation has been arranged with the Scout Councils of the Boy Scouts of America in New Hampshire, whereby scouts are presented with medals for service rendered to the state for extinguishing or reporting forest fires. The Forestry Commission personally offered medals to be presented each year by a committee of award, consisting of the governor, the state forester, and a scout commissioner designated by the chief scout. The Forestry Commission has furnished all scout masters with a memorandum of this agreement and blanks

to be filled out for any cases of especially meritorious work which the boys have done in fire prevention, and which they think merits the consideration of the committee of award. These blanks are to be signed by the scout master and by the town fire warden in whose town the work was done. The agreement has only been in effect for a short time so that its work cannot be reported upon, but it is believed that considerable good will come from it by teaching the boys the importance of fire protection and a respect for the fire laws.

### FOREST FIRES CAUSED BY RAILROADS.

The problem of how to prevent railroad fires is one which hitherto has hindered the progress of forestry very markedly in most sections of the country. It has also caused the railroad companies a great deal of annoyance and expense, and until recent years has seemed to be unsolved. However, the increasing use of oil for fuel, the better construction of spark arresters and ash pans on coal burning locomotives, the construction of fire lines parallel to the railroad right of way, and the maintenance of railroad patrol during times of drought have reduced the danger in recent years very materially on all roads that have inaugurated these measures. New Hampshire, on account of her extensive railroad mileage, many curves, heavy grades, and large amount of forest land abutting railroad rights of way, has suffered very greatly from such fires. Each report of the Forestry Commission has discussed this question and made suggestions for the diminution of the damage, but there has been no legislation enacted except Chapter 159 of the Public Statutes, which makes every railroad liable for the damage caused by fire from its locomotives.

The damage done by railroad fires was especially severe in 1911, during the protracted drought. One hundred and eighty-one railroad fires were reported by

the forest fire wardens, and the reported damage was about one hundred and fifteen thousand dollars. The cost of fighting and settlement for damages of railroad fires was probably greater in 1911 than in any previous year.

A few years ago, the Maine Central Railroad began systematic work for fire prevention, viz: making it the duty of one man in each section crew to patrol the track, following trains. This work was especially effective during the dry season of 1911, patrolmen being provided with velocipedes so that they could keep their section well covered. They would carry on these velocipedes a shovel or hoe, a bucket of water and a mop to put out small fires. During the summer of 1911, there was only one fire which got beyond the right of way of this company in New Hampshire to do any considerable damage. On account of the heavy grades, this company has recently been using a number of oil burning engines, and these entirely eliminate the fire risk for the trains on which they are used.

In February, 1912, the Boston & Maine Railroad organized a Department of Fire Claims, to have charge of all fire claim adjustments, including forest fires, and the work of fire prevention. Soon after the establishment of that department, an agreement was made with the Forestry Commission covering the following points:

1. Section foremen to be appointed deputy forest fire wardens, having charge of railroad fires; the railroad company to assume all expenses incurred by such deputies without charge to the town or state.

2. Town forest fire wardens and other deputies are instructed to fight any railroad fire discovered in their town until such time as the railroad deputy shall arrive and take charge; the railroad company to assume all expense occurring before or after his arrival. The fire warden and deputy fire wardens shall render to the section foreman an itemized account of such expenses at the time the railroad deputy takes charge.

3. All town wardens and deputies shall report railroad fires immediately to the nearest station agent. The station agents are instructed by the railroad to secure assistance for the extinguishment of said fires at once.

4. Said section foremen, when appointed as deputies, are restricted in their duties to combating railroad fires only.

5. The railroad officials will post fire warning notices, to be furnished by the Forestry Commission, in a conspicuous place in each station.

6. The railroad will enforce its regulation concerning the blowing of a fire signal of one long and three short whistles on passing a fire.

Since this agreement took effect the railroad company has been clearing brush along some of its right of way where there exists great danger from fire. The employees of the company report that in some cases they have had difficulty in getting permission to clear away the brush on private land abutting the right of way, and in order to lessen the fire risk to adjacent property it would seem that such permission should be granted by law. For 1912, there were about seven hundred and thirty railroad fires reported in New Hampshire, but most of them were put out before they did any material damage. The total damage done by the fires which escaped was much less than in 1911.

#### THE EXTENSION OF PREVENTIVE MEASURES.

The commission believes that the elimination of railroad fires would be a great step forward in the progress of forestry, and that such measures should be taken to accomplish this end as are practicable and fair both to the railroad companies and the owners of forest property. After studying the measures which have been most effective in other states and the particular conditions which are to be met in New Hampshire, the commission believes that on all railroad lines where oil is

not used for fuel, the companies should be obliged to maintain patrols along the track during times of drought, to clear off brush and inflammable material, and maintain fire lines parallel to the track and not less than one hundred feet from the rail; and that in carrying out this work the railroad company should have the right to enter upon private property without action for trespass.

## THE WORK OF TOWN FOREST FIRE ORGANIZATIONS.

### APPOINTMENT OF WARDENS AND DEPUTIES.

In compliance with the forestry law of 1909, a forest fire warden was appointed by the state forester in each town, city and unincorporated place. These wardens were given instructions as to their duties and furnished with copies of the law, blanks for all required reports, and cloth fire warning notices for posting. One of the most important changes made in the law in 1911 provided for the appointment of deputy wardens in different sections of each town to assist the town warden in fighting and preventing forest fires. When the latter act took effect the state forester requested the mayors of cities and boards of selectmen of towns to recommend men who would make good deputy wardens. Through the recommendations thus made and the assistance of woodland owners and others interested in forest protection, four hundred and nineteen deputies have been appointed. The aim has been to secure for every locality where fires may occur a reliable man who can be reached by telephone and who can get out a force of men quickly and handle them effectively in fighting fire.

### ASSISTANCE BY DISTRICT CHIEFS.

One of the most important duties of the district chiefs is to visit the towns in their respective districts and

assist the warden to effect a better organization. They have helped the warden to get good deputies to assist him, have secured the coöperation of persons living at natural lookout points in notifying the wardens and deputies by telephone when fires are discovered. They have also advised the warden about the best kind of tools and fire apparatus to use, and have interested the selectmen of many towns to purchase such equipment. They have taken personal charge of a number of large fires which extended into more than one town, and subsequently helped the wardens to adjust the expense fairly between the towns involved. The supervision and aid of the district chiefs is largely responsible for the increased efficiency of the town forest fire organizations.

#### WARDEN CONFERENCES.

The conferences of forest fire wardens, provided for in the law of 1911, have improved the fire service by the exchange of ideas, and by giving the wardens of adjoining towns a chance to get acquainted and agree on co-operative measures. Nine such conferences were held in February and March, 1912, two in Concord and one each in Keene, Nashua, Portsmouth, North Conway, Woodsville, Lancaster and Berlin. The members of the Forestry Commission presided over these conferences and spoke to the wardens on the work of the department. The state forester explained the forest fire law and the duties of wardens and deputies. The district chiefs spoke on the work in their respective districts. The meetings were then given over to informal talks, and the wardens discussed freely how the fire law operated in the different towns, asked questions of the commission and the state forester about their duties and the interpretation of the law, and exchanged opinions as to the best methods of fighting fire and securing the assistance of the town's people in preventing fires.

## TOWN FIRE FIGHTING EQUIPMENT.

The personal visits of the district chiefs and the discussions at the warden conferences have brought out the fact that most towns have had very little equipment for use in fighting forest fires. In many cases needless expense has been incurred when men were summoned to fight fire and no tools were provided for them to work with. The commission sent a circular letter to all wardens and boards of selectmen prior to the 1912 town meetings, urging them to provide funds for the purchase of fire fighting equipment, and mentioning the tools and apparatus that had proved effective in different sections of the state.

A few towns have purchased fire wagons equipped with chemical extinguishers, water cans, pails, shovels, mattocks, rakes, axes, etc. Some have bought chemical extinguishers and placed a few at different parts of the towns. A number of towns which contain considerable rough hill and mountain land have purchased one or more of the boxes and tool combinations used by the New Hampshire Timberland Owners' Association, and itemized on page 27. The city of Franklin last year bought an automobile chemical for use both in city and forest fires. It is similar to the one used in Manchester, and is a most effective apparatus for bringing a brush fire quickly under control.

## BETTER OBSERVANCE OF THE FOREST FIRE LAW.

One of the important amendments to the forestry law made in 1911 fixed the dates (April 1 and November 1) between which persons who burn brush in or near woodland are required to get the permission of the forest fire warden. This enactment has proved very beneficial. Such permission was previously required only "in times of drought," and the law was not nearly so effective, inasmuch as it is difficult to determine what constitutes a time of drought.



The wardens have been provided with blank forms for issuing these permits, a memorandum of every permit being forwarded to the state forester and one retained by the warden. In 1912, 269 such permits were issued. A more general compliance with this statute is also indicated by the fact that a relatively smaller number of fires were reported as due to brush burning in 1911 and 1912 than in the two previous years.

The legislature of 1911 passed an act requiring the use of spark arresters on portable steam sawmills and authorizing the state forester to have these mills examined when necessary. The district chiefs and forest fire wardens have examined a great many of these mills and have generally found that satisfactory spark arresters are in use. In a few cases it was necessary to require the use of better ones.

The sawdust piles left after portable steam-mill jobs have caused a number of towns annoying and expensive fires. Sometimes these fires are caused by sparks from the stack which start before the operation is finished, and sometimes they are set accidentally after the mill has been removed. It would seem advisable to require the ground to be cleared of inflammable material for a safe distance around a mill site and sawdust pile before the mill is removed.

Section 15 authorizes forest officers to arrest without warrant persons taken in the act of violating any of the laws for the protection of forests. Section 19 provides that fines collected for such violations shall be deposited with the state treasurer and paid upon requisition of the state forester for use in preventing forest fires. Under these sections ninety dollars has been paid to the state treasurer, being fines imposed upon several men in Manchester who were arrested in the fall of 1910 by Mr. Oscar Stone, who was forest fire warden at that time. It is the purpose of the Forestry Commission to use such money for fire prevention work in the towns or cities where the fines were collected.

COST OF FIGHTING FOREST FIRES SHARED BY THE STATE  
AND THE TOWNS.

After each fire at which expense is incurred, an itemized bill is made out by the warden in charge and sent to the selectmen for approval and payment. A copy of this bill, signed by the warden and selectmen and certified by the town treasurer, is then forwarded to the state forester. Upon his approval and that of the state auditor the bill is presented to the governor and council and if approved the state's share is paid back to the town.

The number of severe fires occurring in 1911 was unprecedented in New Hampshire. The expense of fighting was so great that the state appropriation was soon exhausted in reimbursing the towns for half the amount of each bill. At the end of the fire season the towns which had not been paid after the state appropriation was exhausted were reimbursed by the Governor and Council from their special contingent fund. At the same time the Governor and Council instructed the Forestry Commission not to approve town fire bills for more than \$4,500 for 1912, this sum being the amount appropriated, and being all the Governor and Council had at their disposal.

Accordingly the commission sent letters to all boards of selectmen and mayors of cities prior to the 1912 fire season, advising them that all forest fire bills would be kept on file with the commission until the end of the fiscal year; that if half the total from all the towns did not exceed \$4,500, one half the expenses incurred by each town would be paid by the state; but if half the total was greater than the \$4,500 available, the towns would be paid proportionately. At the end of the fiscal year one half the total bills received amounted to \$7,053.87. The \$4,500 was used proportionately among all the towns and each town was reimbursed for about one third of its total expense.

TABLE III.  
RESULTS OF FOREST FIRES.  
Classified by Counties—Two Years Ending August 31, 1912.

COUNTY.	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Belknap .....	31	1,668½	\$19,455.00	18	1,924¼	\$11,792.50	49	3,592¾	\$31,247.50
Carroll .....	46	15,357¾	51,037.00	24	603¾	2,845.00	69	15,960½	53,882.00
Cheshire .....	57	2,189¾	10,554.50	32	302¾	11,665.00	89	2,492½	22,219.50
Cooks .....	33	4,323	15,118.00	23	1,992¾	8,254.00	56	6,315¾	23,372.00
Grafton .....	48	1,614 ⅞	3,166.00	70	832¾	3,532.00	118	2,447¾	6,698.00
Hillsborough .....	148	8,018¾	58,572.00	53	678¾	8,885.00	203	8,697½	67,457.00
Merrimack .....	125	8,322¾	65,697.50	64	1,376¾	3,994.00	189	9,698½	69,691.50
Rockingham .....	98	4,895¾	34,050.00	45	468¾	5,318.00	143	5,364½	39,368.00
Strafford .....	42	1,965½	19,309.00	25	746½	4,401.00	67	2,712	23,710.00
Sullivan .....	20	539½	1,890.00	30	243¾	621.00	50	782¾	2,511.00
Unincorporated places...	2	2½	.....	6	1,300¾	6,660.00	9	1,302¾	6,660.00
Totals .....	649	48,877½	\$278,749.00	390	10,469¾	\$67,967.60	1,039	59,366¾	\$346,716.00

## FOREST FIRE DAMAGE IN 1911 AND 1912.

## FIRE SEASONS AND DROUGHT.

There are three times of year when there is particular danger from forest fires in New Hampshire: 1. The early spring fishing season begins soon after the snow is gone and before the green growth starts. The forest floor is dry and the winds are higher than usual. The numerous fishermen along streams who smoke and build camp fires make the danger from fire acute. 2. The tourist season begins in June and lasts through midsummer and early fall, during which time there are a great many people tramping over the mountain trails building camp fires. 3. The hunting season begins about the time the leaves fall in autumn, and from then on until snow falls there is considerable fire danger from hunters. Other causes, such as sparks from locomotives, lightning, brush burning and maliciousness operate throughout all three of these seasons. A drought during any of these periods makes the forest fire danger very serious.

Not since the dry spring of 1903 have the weather conditions favored the starting and spread of forest fires as in 1911. The snow went off early and the spring was unusually dry. From the middle of April until the first of June, there were only a few light showers at such long intervals as to do no good in stopping fires. The drought was broken by good rains the first of June and the middle of June. It became severe again during the latter part of June, and an unprecedented spell of hot weather followed by many electrical storms made the situation very serious. When the second drought was broken late in July, New Hampshire had passed through the most dangerous fire year on record. There was also considerable dry weather in 1912. It was not general throughout the state, but most severe in the northern part. The two periods of drought in 1911 were general and of about thirty-five and thirty days respectively.

The drought of 1912 in the mountain region lasted about thirty-eight days. The drought of 1903 lasted fifty-two days, but was confined entirely to the northern part of the state.

TABLE IV.

## ACRES BURNED BY FOREST FIRES.

September 1, 1910, to August 31, 1912.

COUNTY	Merchantable Timberland	Second Growth	Cut-over Land	Pasture and Fields.	Total
Belknap .....	232	1,609	1,381	371	3,593
Carroll .....	3,221	4,062	7,550	1,128	15,961
Cheshire .....	220	1,464	473	335	2,492
Coös .....	458	5,715	1,283	163	7,619
Grafton .....	205	691	1,150	402	2,448
Hillsborough .....	2,121	4,480	998	1,099	8,698
Merrimack .....	1,171	6,561	1,244	722	9,698
Rockingham .....	533	2,613	974	1,244	5,364
Strafford .....	373	1,135	537	667	2,712
Sullivan .....	125	268	152	238	783
Total .....	8,659	28,598	15,742	6,369	59,368

TABLE V.  
DAMAGE CAUSED BY FOREST FIRES.  
September 1, 1910, to August 31, 1912.

COUNTY	Timber and Sprouts	Buildings, Fences, etc.	Stacked Lumber	Cut wood, pulp or logs	Total
Belknap .....	\$15,992.50	\$4,575.00	\$4,640.00	\$6,040.00	\$31,247.50
Carroll .....	42,807.00	875.00	9,200.00	1,000.00	53,882.00
Cheshire .....	11,148.50	315.00	10,000.00	756.00	22,219.50
Coös .....	26,820.00	3,032.00	20.00	160.00	30,032.00
Grafton .....	5,798.00	450.00	50.00	400.00	6,698.00
Hillsborough .....	37,007.00	11,060.00	17,700.00	1,690.00	67,457.00
Merrimack .....	52,779.00	15,560.50	.....	1,252.00	69,591.50
Rockingham .....	32,043.00	2,630.00	3,600.00	1,095.00	39,368.00
Strafford .....	19,844.00	2,565.00	425.00	876.00	23,710.00
Sullivan .....	2,440.00	51.00	.....	20.00	2,511.00
Total .....	\$246,679.00	\$41,113.50	\$45,635.00	\$13,289.00	\$346,716.50

#### EXTENT AND CHARACTER OF DAMAGE.

Table III shows the number of fires reported, area burned and damage classified by counties for the two years ending August 31, 1912. The damage in 1911 was much less in the northern counties,—Grafton, Carroll and Coös,—than in the southern counties, due largely to the mountain lookout and patrol service developed through coöperation with the United States Forest Service and the New Hampshire Timberland Owners' Association. The damage in 1912 was very much less than in 1911.

Tables IV and V show the kinds of land burned over and the character of the damage. The greatest acreage burned was on sprout land, the source of the future

timber crop. The next largest burned acreage was on cut-over land. This is also responsible for other damage as a great many fires started on cut-over land and spread to young or mature timber. Many fires also started on pastures or fields and spread to woodlands. By far the greatest damage was done to standing timber and sprouts, on which there is no insurance. Stacked lumber and improvements, such as buildings and fences, also suffered heavily, but part of this is covered by insurance.

According to investigations made by the Forest Service some years ago, there are about 4,000,000 acres of timberland in New Hampshire, including cut-over land. During the past two years there have been burned over 59,305 acres, or one and one half percent of the total woodland area of the state.

The following tabular report shows the number of fires reported, the area burned, and the damage in each town, city and unincorporated place during the past two years:

## BELKNAP COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Alton .....	6	370	\$2,705.00	5	1,515	\$5,142.50	11	1,885	\$7,847.50
Barnstead .....	5	41	3,650.00	4	102½	5,020.00	9	143¼	8,670.00
Belmont .....	4	515	10,050.00	6	150	1,110.00	10	665	11,160.00
Center Harbor .....	1	3	1,000.00	.....	.....	.....	1	3	1,000.00
Gilford .....	8	158	655.00	.....	.....	.....	8	158	655.00
Gilmanton .....	4	516	1,270.00	1	150	500.00	5	666	1,770.00
Laconia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Meredith .....	2	35½	75.00	.....	.....	.....	2	35½	75.00
New Hampton .....	1	30	50.00	.....	.....	.....	1	30	50.00
Sanbornton .....	.....	.....	.....	2	7	20.00	2	7	20.00
Tilton .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Totals .....</b>	<b>31</b>	<b>1,668½</b>	<b>\$19,465.00</b>	<b>18</b>	<b>1,924¼</b>	<b>\$11,792.50</b>	<b>49</b>	<b>3,592¼</b>	<b>\$31,247.50</b>

REPORT OF FORESTRY COMMISSION.



## CARROLL COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Albany .....	1	½	.....	1	40	\$150.00	2	40½	\$150.00
Bartlett .....	6	.....	.....	7	34½	90.00	7	34½	90.00
Brookfield .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chatham .....	1	¾	.....	.....	.....	.....	1	¾	.....
Conway .....	6	19½	\$175.00	3	1½	.....	9	21	175.00
Eaton .....	1	12	75.00	3	5¼	25.00	4	17¼	100.00
Eppingham .....	2	13	201.00	.....	.....	.....	2	13	201.00
Freedom .....	3	4,110	10,100.00	2	8	5.00	5	4,118	10,105.00
Hart's Location .....	.....	.....	.....	1	22	25.00	1	22	25.00
Jackson .....	.....	.....	.....	1	400	2,200.00	1	400	2,200.00
Madison .....	3	515¼	1,240.00	2	41	50.00	5	556¼	1,290.00
Moultonborough .....	1	325	500.00	.....	.....	.....	1	325	500.00
Ossipee .....	11	3,580	7,476.00	1	.....	.....	12	3,580	7,476.00
Sandwich .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamworth .....	3	155	325.00	.....	.....	.....	3	155	325.00
Tuftonborough .....	1	25	250.00	.....	.....	.....	1	25	250.00
Wakefield .....	5	6,595	30,670.00	3	51	300.00	12	6,646	30,970.00
Wolfeboro .....	3	7	25.00	.....	.....	.....	3	7	25.00
Totals .....	45	15,357¾	\$51,037.00	24	603¼	\$2,845.00	69	15,960¾	\$53,882.00

CHESHIRE COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Alstead .....	2	4	\$1.00				2	4	\$1.00
Chesterfield .....	4	204	1,010.00	3	4¼		7	208¼	1,010.00
Dublin .....				1	1		1	1	
Fitzwilliam .....				1	6	\$1,000.00	1	6	1,000.00
Gilsum .....				1	7		1	7	
Harrisville .....	3	11	115.00	3	67	9,135.00	6	78	9,250.00
Hinsdale .....	10	418¾	945.00	3	41	525.00	13	459¾	1,470.00
Jaffrey .....	4	164¼	62.00	7	75	800.00	11	239½	862.00
Keene .....	6	198½	350.00	6	24½	80.00	12	223	430.00
Marlborough .....	1	250	4,000.00	2	½		3	250½	4,000.00
Marlow .....	2	1¼					2	1¼	
Nelson .....									
Richmond .....	2	50	300.00				2	50	300.00
Rindge .....	2	70	700.00				2	70	700.00
Roxbury .....	2	69	1,516.00				2	69	1,516.00
Stoddard .....									
Sullivan .....									
Surry .....	1	300	500.00				1	300	500.00
Swanzy .....	7	48¾	440.50	1	1½	25.00	8	50¼	465.50
Troy .....									
Walpole .....				1	45	100.00	1	45	100.00
Westmoreland .....	2	20	100.00	1			3	20	100.00
Winchester .....	9	380	515.00	2	30		11	410	515.00
Totals .....	57	2,189¾	\$10,554.50	32	302¾	\$11,665.00	89	2,492¼	\$22,219.50

REPORT OF FORESTRY COMMISSION.

COOS COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Berlin .....	5	3,012	\$5,010.00	4	53¼	\$3,015.00	9	3,065¼	\$8,025.00
Carroll .....	1	250	100.00	5	44½	.....	6	294½	100.00
Clarksville .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colebrook .....	2	13	81.00	.....	.....	.....	2	13	81.00
Columbia .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dalton .....	2	75	70.00	.....	.....	.....	2	75	70.00
Dummer .....	2	16¼	210.00	.....	.....	.....	3	18¾	210.00
Errol .....	1	15	.....	1	2	.....	1	15	.....
Gorham .....	.....	.....	.....	5	1,660	3,700.00	5	1,660	3,700.00
Jefferson .....	2	40	.....	.....	.....	.....	2	40	.....
Lancaster .....	4	327¼	1,345.00	3	6	7.00	7	333½	1,352.00
Milan .....	2	.....	.....	1	50	1,000.00	3	67	1,000.00
Northumberland .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburg .....	1	2	5.00	.....	.....	.....	1	2	5.00
Randolph .....	4	5¼	.....	1	15	30.00	5	20¼	30.00
Shelbourne .....	2	450	8,000.00	.....	.....	.....	2	450	8,000.00
Stark .....	1	5	.....	.....	.....	.....	1	5	.....
Stewartstown .....	1	7	250.00	1	100	500.00	2	107	750.00
Sirratford .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wentworth Location .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Whitefield .....	.....	87	47.00	2	62	2.00	5	149	49.00
Unincorporated places .....	2	2¼	.....	6	1,300¼	6,660.00	9	1,302¾	6,660.00
Totals .....	35	4,325¼	15,118.00	29	3,293½	\$14,914.00	64	7,618¾	\$30,032.00

## GRAFTON COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Alexandria .....									
Ashland .....	2	2	\$15.00	2	1½	\$100.00	4	3½	115.00
Bath .....	1	10	35.00	3	39	200.00	4	49	235.00
Benton .....	1	150	750.00				1	150	750.00
Bethlehem .....	6	50½	45.00	11	98½	201.00	17	149	246.00
Bridgewater .....				1	8	100.00	1	8	100.00
Bristol .....									
Campton .....	1	400	200.00	2	100½	255.00	3	500½	455.00
Canaan .....	2	18		6	160	475.00	8	178	475.00
Dorchester .....				1			1		
Enston .....									
Ellsworth .....									
Enfield .....									
Franconia .....	5	6½	5.00	2	1		7	7½	5.00
Grafton .....									
Groton .....	2	145	425.00				2	145	425.00
Hanover .....									
Haverhill .....	3	58	750.00	6	17¾	80.00	9	75¾	830.00
Hebron .....				1	5				
Holderness .....	1	¾					2	5½	
Landaff .....				1	¾		1	¾	
Lebanon .....				1	70	\$1,000.00	1	70	1,000.00
Lincoln .....	3	7¼	\$12.00				3	7¼	\$12.00
Lisbon .....									
Littleton .....				5	80	\$300.00	5	80	300.00
Livermore .....	1	200	25.00	2			3	200	25.00
Lyman .....	2	27	175.00				2	27	175.00
Lyme .....				1			1		
Monroe .....				1	50	500.00	1	50	500.00
Orange .....				2	30		2	30	
Orford .....	1	50	200.00	1	100	50.00	2	150	250.00

GRAFTON COUNTY—Continued.

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Piermont .....	1	½	.....	1	1	.....	1	½	.....
Plymouth .....	1	4	.....	1	1	.....	2	5	.....
Rumney .....	4	206	262.00	3	12½	7.00	7	218½	269.00
Thornton .....	1	3	30.00	.....	.....	.....	1	3	30.00
Warren .....	7	24%	202.00	6	10¼	75.00	13	35	277.00
Waterville .....	1	250	25.00	.....	.....	.....	1	250	25.00
Wentworth .....	.....	.....	.....	2	20½	14.00	2	20½	14.00
Woodstock .....	2	1%	10.00	9	26%	175.00	11	28½	185.00
Totals .....	48	1,614%	\$3,166.00	70	832%	\$3,532.00	118	2,447%	\$6,698.00

## HILLSBOROUGH COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Amherst .....	8	1,222	\$12,680.00	1	.....	.....	9	1,222	\$12,680.00
Antrim .....	.....	.....	.....	.....	8	10.00	1	8	10.00
Bedford .....	2	33	120.00	4	20	500.00	6	53	620.00
Bennington .....	5	234	117.00	1	15	80.00	6	249	197.00
Brookline .....	4	23	128.00	1	5	30.00	5	28	158.00
Daerling .....	1	500	24,200.00	.....	.....	.....	1	500	24,200.00
Francestown .....	3	52½	160.00	2	25	.....	5	77½	160.00
Goffstown .....	11	64¾	95.00	4	18%	360.00	15	83	455.00
Greenfield .....	.....	.....	.....	1	4	15.00	2	4	15.00
Greenville .....	2	17	30.00	.....	.....	.....	2	17	30.00
Hancock .....	3	72	90.00	1	.....	.....	4	72	90.00
Hillsborough .....	9	74	640.00	1	.....	.....	10	74	640.00
Hollis .....	4	38	345.00	3	75¼	1,000.00	7	113¼	1,345.00
Hudson .....	7	147	670.00	5	20%	4,000.00	12	167%	4,670.00
Litchfield .....	2	64½	245.00	.....	.....	.....	2	64½	245.00
Lyndeboro .....	2	460	200.00	.....	.....	.....	2	460	200.00
Manchester .....	40	1,698½	1,996.00	2	2	5.00	42	1,700½	2,001.00
Mason .....	.....	.....	.....	4	5½	10.00	4	5½	10.00
Merrimack .....	7	692	10,805.00	7	69	835.00	14	761½	11,640.00
Milford .....	5	1,240	312.00	.....	.....	.....	5	1,240	312.00
Mont Vernon .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nashua .....	11	753	1,875.00	1	65	1,000.00	12	818	2,875.00
New Boston .....	6	48	62.00	1	50	\$50.00	7	98	\$102.00
New Ipswich .....	3	249	2,260.00	2	75	400.00	5	324	2,660.00
Pelham .....	5	178	497.00	.....	.....	.....	5	178	497.00
Peterborough .....	.....	.....	.....	4	35%	150.00	4	35%	150.00
Sharon .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Temple .....	1	10	125.00	2	182	200.00	3	192	325.00
Weare .....	7	148	930.00	2	1%	.....	9	149%	930.00
Wilton .....	.....	.....	.....	4	9½	250.00	4	9½	250.00
Windsor .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Totals .....</b>	<b>148</b>	<b>8,018%</b>	<b>\$58,572.00</b>	<b>53</b>	<b>678%</b>	<b>\$8,885.00</b>	<b>203</b>	<b>8,697%</b>	<b>\$67,457.00</b>

MERRIMACK COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Allenstown				2	9	\$500.00	2	9	\$500.00
Andover				2	28	110.00	2	28	110.00
Boscawen	4	10%	\$275.00	4	68½	530.00	8	79½	805.00
Bow	3	516	2,650.00	2	3½	62.00	5	519½	2,712.00
Bradford	1						1		
Canterbury	3	602	1,350.00				3	602	1,350.00
Chichester	1	2					1	2	
Concord	40	3,316	50,563.00	9	35		49	3,351	50,563.00
Danbury									
Dunbarton	1	1½		2	13	50.00	3	14½	50.00
Epsom	4	127½	815.00	3	23	110.00	7	150½	925.00
Franklin	16	368	462.00	5	18	145.00	21	386	607.00
Henniker	4	341½	340.00	2	7 5-24		6	416 17-24	340.00
Hill				3	46	225.00	3	46	225.00
Hooksett	9	858½	5,485.00	3	835	400.00	12	1,693½	5,885.00
Hopkinton	7	1,519	197.50	4	102	1,150.00	11	1,621	1,347.50
Loudon				2	40	50.00	2	40	50.00
Newbury	7	6	10.00	6	20⅔	460.00	13	26⅔	470.00
New London	1	1	10.00	4	⅞	25.00	5	1⅞	35.00
Northfield	1	4	75.00	2	29	150.00	3	33	225.00
Pembroke	1	5	20.00	1	5		2	10	20.00
Pittsfield				2	3½		2	3½	
Salisbury	4	29	140.00				4	29	140.00
Sutton				1	½		1	½	
Warner	13	597	2,680.00	2	11		15	608	2,680.00
Webster	4	13	325.00	2	9	17.00	6	22	342.00
Wilmot	4	5	200.00	1	½		2	5½	210.00
Totals	125	8,322%	\$65,597.50	64	1,375%	\$3,994.00	189	9,698%	\$69,591.50

## ROCKINGHAM COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Atkinson .....	5	514	\$1,955.00	5	198	\$625.00	10	712	\$2,580.00
Auburn .....	1	40	350.00	1	40	350.00	2	80	700.00
Brentwood .....	1	100	2,800.00	1	10	60.00	2	110	2,860.00
Candia .....	3	707	10,305.00	7	51½	2,320.00	10	758½	12,625.00
Chester .....	1	20	150.00	1	20	150.00	2	40	300.00
Danville .....	1	13	90.00	1	13	90.00	2	26	180.00
Deerfield .....	4	16	810.00	4	16	810.00	8	32	1,620.00
Derry .....	1	15	5.00	1	15	5.00	2	30	10.00
East Kingston .....	10	58¾	650.00	1	1	25.00	11	59¾	675.00
Epping .....	9	49	1,775.00	2	34	825.00	11	83	2,600.00
Exeter .....	8	49½	377.00	1	3	15.00	9	52½	392.00
Fremont .....									
Greenland .....									
Hampstead .....									
Hampton .....									
Hampton Falls .....									
Kensington .....									
Kingston .....	4	13	285.00	4	13	285.00	8	26	570.00
Londonderry .....	4	457	725.00	3	7	725.00	7	464	1,450.00
Newcastle .....									
Newfields .....	4	179	1,020.00	3	3¾	38.00	7	182¾	1,058.00
Newington .....	1	5	300.00	1	5	300.00	2	10	600.00
Newington .....	5	54	100.00	3	3	100.00	8	57	200.00
Newmarket .....	2	56	1,885.00	2	56	1,885.00	4	112	3,770.00
Newton .....									
North Hampton .....									
Northwood .....	6	1,495	610.00	6	1,495	610.00	12	2,990	1,220.00
Nottingham .....	3	28	53.00	2	11	53.00	5	39	106.00
Nottingham .....	3	82	1,575.00	3	82	1,575.00	6	164	3,150.00
Plastow .....									
Portsmouth .....									
Raymond .....	2	35	\$200.00	2	35	\$200.00	4	70	\$400.00
Rye .....	1	70	500.00	1	70	500.00	2	140	1,000.00



ROCKINGHAM COUNTY—Continued.

NAME OF TOWN	Sept. 10, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Salem .....	12	321	\$940.00	8	47	.....	20	368	\$940.00
Sandown .....	3	211	2,600.00	.....	.....	.....	3	211	2,600.00
Seabrook .....	4	256	4,500.00	3	49	\$400.00	7	305	4,900.00
South Hampton .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stratham .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Windham .....	3	71	500.00	.....	.....	.....	3	71	500.00
Totals .....	98	4,895½	\$34,050.00	45	468%	\$5,318.00	143	5,364½	\$39,368.00

STRAFFORD COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Barrington .....	2	475	\$5,000.00	1	6	\$100.00	3	481	\$5,100.00
Dover .....	5	94	1,245.00	5	94	1,245.00	10	188	2,490.00
Durham .....	3	46	223.00	7	77	1,925.00	10	123	2,148.00
Farmington .....									
Lee .....									
Madbury .....	1	2					1	2	
Middleton .....				6	65	90.00	6	65	90.00
Milton .....	9	26½	226.00	3	16½	345.00	12	42¾	571.00
New Durham .....	3	105¼	325.00	4	284	1,135.00	7	389¼	1,360.00
Rochester .....	10	859	9,870.00	2	13	506.00	12	872	10,376.00
Rollinsford .....	3	14	50.00				3	14	50.00
Somersworth .....	4	295	2,440.00				4	295	2,440.00
Strafford .....	2	49	30.00	2	285	300.00	4	334	330.00
Totals .....	42	1,965½	\$19,309.00	25	746½	\$4,401.00	67	2,712	\$23,710.00

## SULLIVAN COUNTY

NAME OF TOWN	Sept. 1, 1910—Aug. 31, 1911			Sept. 1, 1911—Aug. 31, 1912			Totals for two years		
	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage	No. Fires	Area Burned	Damage
Acworth .....	3	282	\$65.00	.....	.....	.....	3	282	\$65.00
Charlestown .....	4	60	645.00	1	½	.....	5	60½	645.00
Claremont .....	3	47	275.00	17	81¾	\$421.00	20	128¾	696.00
Cornish .....	1	7	50.00	.....	.....	.....	1	7	50.00
Croydon .....	1	2	.....	1	1	.....	2	3	.....
Gosher .....	.....	.....	.....	1	½	.....	1	½	.....
Grantham .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Langdon .....	3	41½	90.00	.....	.....	.....	3	41½	90.00
Lempster .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newport .....	.....	.....	.....	6	29½	50.00	6	29½	50.00
Plainfield .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield .....	2	61	700.00	2	120	100.00	4	181	800.00
Sunapee .....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unity .....	1	10	.....	2	10	50.00	3	20	50.00
Washington .....	2	29	65.00	.....	.....	.....	2	29	65.00
Totals .....	20	539½	\$1,890.00	30	243¾	\$621.00	50	782¾	\$2,511.00

## CAUSES OF FOREST FIRES.

The following is a tabulated list of the causes of forest fires, as reported by the wardens during the past two years:

TABLE VI.

CAUSES.	1911 No. Fires	1912 No. Fires
Unknown .....	163	139
Railroads .....	181	67
Burning brush .....	72	47
Smoking .....	56	37
Campers, hunters, and fishermen.....	43	27
Lightning .....	47	18
Incendiary .....	38	15
Berry-pickers .....	13	2
Portable sawmills .....	6	6
Destroying moths .....	5	2
Mayflower-pickers .....	2	3
Burning sawdust pile .....	2	2
Wood choppers .....	2	2
Burning building .....	3	6
Previous fire .....	4	5
Other causes* .....	5	12
Total .....	649	390

\*Other causes include two fires caused by blasting; also carelessness of children with fireworks, matches, etc.

$$\begin{array}{r} 65 \overline{)181} \text{ (28} \\ \underline{130} \\ 510 \end{array}$$

$$\begin{array}{r} 29 \overline{)670} \text{ (18} \\ \underline{58} \\ 280 \\ \underline{212} \end{array}$$

## EDUCATIONAL AND SCIENTIFIC WORK.

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Sections 2 and 3 of the forestry law, as amended in 1911, provide for the state forester giving educational lectures, exhibits at fairs, and advice and assistance to counties, towns, corporations and individuals in preparing plans for the practical application of forestry to woodlands. It also authorizes him to conduct investigations on forestry matters and publish the results in bulletins for general distribution.

### EDUCATIONAL.

The growing interest in forestry throughout the state is reflected in the large number of requests made upon the state forester for information and assistance. This interest has been stimulated by the activities of the commission and the coöperation of the press throughout the state. On account of the time required in supervising the fire protection work, the state forester has been unable to give very much time to such requests. As full information as possible was given by correspondence and consultation. In a few cases only was it possible to visit the woodland in question and give the owner specific advice on the ground. Public lectures and fair exhibits helped to get information on the practical application of forestry spread among farmers and woodland owners, the state forester has given lectures before granges, boards of trade, societies and associations. Fair exhibits were given in the fall of 1911 at Greenfield, Rochester, Plymouth and New Boston. For lack of funds, exhibits could not be given in 1912.

The following publications have been issued and may be secured free of charge upon request :

**"Forest Laws and Organization of the Forestry Department."** This bulletin was issued in July, 1911, and a revised copy published in 1912. It gives the forestry laws, a list of forest fire wardens and deputies, lookout watchmen and patrolmen with instructions to all employees charged with the execution of the forest fire laws. It also sets forth the other work carried on by the commission, and how citizens may obtain assistance in reforestation and the care of woodland

**"Reforestation Waste and Cut-Over Land."** This four-page circular was published in March, 1912, and distributed to all persons applying for it or known to be interested in reforestation. It gives the law providing for tax abatement on planted land, states briefly the kinds of trees to use in reforestation operations, how to secure and care for them upon arrival, and explains the methods used in setting them out.

**"Wood-Using Industries of New Hampshire."** One of the most important factors in determining the system of forest management to use on any specific tract of woodland is a thorough knowledge of the market conditions. It often happens that the decision as to whether an owner will or will not begin the practice of forestry rests upon determining whether the trees which should be removed to improve the growth of the forest can be taken out at a profit. Realizing the importance of spreading such information throughout the state, the Forestry Commission, in 1911, made application to the United States Forest Service for a detailed study of the wood-using industries of the state.

An agreement was made whereby the state paid two hundred and fifty dollars toward this study, the Forest Service assuming the balance of the expense of the field work and compilation of data. The report was published by the commission in August, 1912, and will be mailed free upon application. This report shows by tables and description the particular uses made of every

kind of wood used in manufacture in New Hampshire, the sources of the supply, the average price paid and the quantity consumed. It further discusses each industry, and gives a classified list of firms manufacturing articles in which wood is used. It is hoped that this report will help both the small and large woodland owners in selling timber of different kinds to the best advantage, and will help the manufacturers in using each other's by-products and reducing waste.

#### ASSISTANCE GIVEN TO OWNERS IN THE PRACTICE OF FORESTRY.

So many requests are received for the examination of woodlots and timber tracts that it is impossible to comply with all of them. This should be one of the most important branches of state forestry work. It should not be forgotten that a good system of fire protection, just forest taxation, and the gathering of scientific information are not ends in themselves, but that their importance lies in establishing conditions that will make it possible for private owners to apply the principles of forestry.

In its last biennial report the Forestry Commission called attention to the number of persons, especially small owners, who were ready to make a beginning in practicing forestry on their woodlands, and recommended employing an assistant forester whose principal duty would be to examine forest land with the owner, and give him specific instructions about improvement cuttings, planting, fire protection, etc. Since that time the number of applications for such instructions have steadily increased, but the state foresters' time being taken up with the fire protective work, only twenty such examinations could be made. Now that a study of the wood-using industries has been made, the value of an assistant on such work would be even greater, as a better knowledge of the market will interest many more woodlot owners in the practice of forestry.

## ASSISTANCE TO COUNTIES AND MUNICIPALITIES.

In January, 1912, a request was made from the City of Keene to have a timber estimate and plan of management made for about fourteen hundred acres which the city has acquired to protect its water supply. An examination of the different tracts belonging to the city was made by the state forester, and a detailed plan and estimate of cost drawn up for carrying on the necessary field work. The plan being approved by the city officials, the field work was done during the summer of 1912 by B. K. Ayers, a student at the Yale Forest School, with William Falconer and J. P. Whittemore as assistants. The work of completing the map and compiling data is now under way. When completed the report will show the amount and kinds of standing timber, and how it varies over the tract, and plans for lumbering, making improvement cuttings and reforestation with cost estimates for each operation.

Applications have been received for similar work from other cities and towns, and from counties. There are nearly ten thousand acres of woodland owned by towns and cities in New Hampshire, principally for protecting sources of water supply. County farms also have considerable forest and waste land which should be put under scientific forest management. Such lands should receive state assistance, as the income from proper forestry methods will increase the public revenue. Also the tracts will serve as demonstration forests to stimulate interest on the part of private owners.

An example of the results of conservative forest management is furnished by the Pennichuck Water Company of Nashua. A systematic plan is carried out for each kind of timber. Brush is piled and burned after logging to reduce the fire risk. Cuttings are made with a view to increasing the growth of the remaining trees and securing a reproduction of the more valuable species. Inasmuch as the company is obliged to own 800 acres to



protect its water reservoir, the incidental profits from forestry are considerable.

#### PROTECTION OF SHADE TREES.

The shade tree law, as amended in 1905, provides for the appointment of a tree warden by the selectmen of each town. It is the tree warden's duty to mark trees along the highways with tags furnished by the Forestry Commission. The towns are permitted to appropriate money for the planting, care and protection of shade trees, and it is the tree warden's duty to institute proceedings to acquire such trees for the town, should they prove to be private property. Tagged trees cannot be removed without the tree warden's permission, and the defacing of any public shade tree is made a misdemeanor.

This law has no doubt prevented considerable injury being done to roadside trees, but it has failed of execution in most towns because the selectmen have not appointed tree wardens. In the cities and some of the larger towns the public interest in shade tree protection has been strong, and the tree warden's work has been effective, not only in preventing the destruction and mutilation of shade trees, but in protecting them against disease and insect enemies. In most rural towns, however, no action has been taken until some violation of the law occurs, and then it is generally found that there is no tree warden to enforce the law.

The preservation of the beauty of our streets and roads is a matter of great importance, not only for the pleasure of our own citizens, but to add to the attractiveness of New Hampshire as a summer resort state. It is also important in connection with our system of highway building, since the proper amount of shade has a direct effect upon the retention of moisture in the road, and therefore affects the question of road maintenance. It further involves the fire protection problem, since the

leaving of slash near the roadway when bushes are cut is responsible for many forest fires.

The present law should be strengthened by offering the towns a little more inducement to appoint tree wardens and provide funds for their work. The state could do this by furnishing trees to the towns free of charge for roadside planting, the towns paying the tree wardens for the time spent in setting the trees out. Along state roads and trunk lines the trees could be planted by the Highway Department, and, in fact, the planting along all roads should be upon the advice of that department as to the species and spacing that will be most conducive to the upkeep of the road. The trees could be raised in the state forest nursery at less expense than would be required to start a separate nursery or purchase them from commercial nurseries, and the Forestry Commission could furnish them to the Highway Department or the town tree wardens as required. Advice should also be given to the tree wardens as to the cutting of bushes along the roads. Often a good growth of roadside trees may be produced more quickly than by planting if thrifty young seedlings and sprouts are selected and protected when roadside bushes are being cut. Whenever such work is being done the town officers should be required to dispose of the slash, and not leave it as a fire trap near the road.

## SCIENTIFIC INVESTIGATIONS.

### FOREST TAXATION.

The subject of forest taxation has been before the New Hampshire public for a number of years. In 1907-1908, the Forestry Commission, in coöperation with the United States Forest Service, published a report on this subject, made by Mr. John H. Foster after a detailed study of conditions throughout the state.

Since that time the commission has made no further study, but the matter has been actively agitated in con-

nection with the whole subject of taxation. In 1905, a Tax Commission was appointed to investigate and report on the whole subject of state revenues. This commission did not take up forest taxation, but approved in general the report of the Forestry Commission made at the same time. The legislature of 1911 made the Tax Commission a permanent board, taking the place, with added duties, of the Board of Equalization.

The Tax Commission this year exercised its authority over town and city assessors, to enforce the law which provides for assessment of property at full value, with the result that the valuation has been raised on all classes of property, including forests. This action brought the matter more concretely before the general public than formerly, and knowledge of the important principles of proper forest taxation has become more general. At the session of the Constitutional Convention of June, 1912, an amendment was passed which, if ratified, will enable the legislature to separately classify and assess forest property for taxation. This amendment also included intangibles and incomes. As the amendment before becoming part of the Constitution must be ratified by two thirds of the voters at the November election, it is impossible to know at this writing whether it will be ratified or not, but assuming that such is the case, the next legislature will no doubt be called upon to consider forest tax legislation.

A fair system of forest taxation must recognize that forest land produces a low yield as compared with agricultural land, that the yield is intermittent and at long periods, and that therefore it cannot stand an annual tax on the full valuation of the property unless that tax be at a very low rate. It must also recognize that annual taxes are desirable to enable our rural towns to carry on public improvements. Furthermore, it must recognize that our scientific knowledge of the income producing value of timberlands, or the rate of growth of trees and types of forest, is as yet very meagre. The

system should be simple, as easy and economical of operation as consistent with fairness, and should begin on a small scale and increase in scope as knowledge and experience shows to be wise.

The Forestry Commission recommends the following essentials to be considered while incorporating such a tax law: 1. That a permanent and well-defined method of scale be assured. 2. That the state exercise continued supervision over scalers. 3. The continuance of the work in the hands of the local assessors under direction of the Tax Commission. 4. That an easily comprehensible plan be devised, using present data, coincident with present conditions and based on the good judgment of the tax assessors. 5. That immediate steps be taken to formulate growth tables, make accurate maps and boundaries and other scientific data necessary to a more precise handling of the question. 6. That the system ultimately devised recognize the taxation of soil productivity and tree growth as the measure of income, and encourage a condition which will make it financially possible to raise forests to maturity.

#### THE CHESTNUT BARK DISEASE.

For nearly a year reports have come to the Forestry Commission that the chestnut bark disease was in New Hampshire. The aid of the Bureau of Plant Industry of the United States Department of Agriculture was sought, and in July, 1912, Dr. Perley Spaulding of that bureau, accompanied by the state forester, made a trip through most of the chestnut region. Diseased trees were found in seven towns, but widely scattered.

The disease is carried by spores which lodge in cracks in the outer bark. It grows in the inner bark, killing it and eventually killing the tree. Small reddish-yellow fruiting bodies then appear on the bark, bearing the spores which carry the disease to other trees. The disease is recognized in summer by the dead yellow leaves

at the top, or on an infected branch. The bark is generally swollen where the disease is working. Below infected places on the trunk the tree often throws out a clump of young sprouts. In winter the leaves usually hang on above the diseased part.

From the center of infestation in New York the disease has spread widely into Connecticut, Massachusetts and Rhode Island. It has also caused great damage in New Jersey, Pennsylvania and states farther south. Pennsylvania has recently appropriated two hundred and seventy-five thousand dollars to check its spread. In many sections so large a percent of the chestnut trees are affected that the cutting and sale of chestnut timber before it becomes unmerchantable has become a serious problem.

Conditions in New Hampshire are more encouraging. Southern New Hampshire is on the northern edge of the chestnut range, infected trees are as yet fewer in number, and the disease is advancing more slowly than farther south. It was Dr. Spaulding's opinion that if the diseased trees could be destroyed within the next few months the disease would be so checked that the present young chestnut sprout stands would have a very good chance of growing to pole size and be marketed before the disease would kill many of the trees.

To carry this out it was necessary to find out more accurately where the diseased trees were located, and then interest the owners to destroy them. Dr. Haven Metcalf, the Pathologist in Charge in the Bureau of Plant Industry, agreed to have the chestnut region in New Hampshire thoroughly scouted, and the Society for the Protection of New Hampshire Forests furnished additional funds for the same purpose. Two field agents, Messrs. E. H. Watkins and L. N. Watson, then began the scouting work. At this writing, the scouting is not entirely finished, and the disease has been found in the following towns:

Amherst.	Mason.	Rindge.
Brookline.	Merrimack.	Swanzey.
Chesterfield.	Milford.	Walpole.
Greenville.	Mount Vernon.	Westmoreland.
Hinsdale.	New Ipswich.	Wilton.
Hollis.	Richmond.	Winchester.

It is probable that it exists in all towns where chestnut is found.

When the territory is all scouted it is planned to send the field agents throughout the chestnut region to meet the landowners, inform them about the disease and how it can be recognized, and how the trees should be destroyed. Most of this work will be done during the winter when snow will permit the trees to be burned without the fire spreading.

The commission recommends that a small appropriation be made as soon as possible to supplement the funds provided by the Department of Agriculture and the Society for the Protection of New Hampshire Forests, so that the work of destroying the diseased trees may be completed during the coming winter. It further recommends that the state forester be given authority to destroy diseased trees upon private land, and that no chestnut lumber, timbers or poles be allowed to enter the state until after the bark, which carries the disease, has been peeled.

#### THE CHRISTMAS TREE INDUSTRY.

Christmas trees have been shipped from New Hampshire in considerable quantities for many years. The question of prohibiting or restricting the cut has often been agitated. Legislation of this kind was before the last legislature, but was rejected, principally because no knowledge was at hand as to the extent of damage caused by such cuttings. During the following summer the Forestry Commission began a systematic study of the question, but for lack of funds has not been able to

complete it. A plan of field study was prepared by the state forester to gather information about the cutting, transportation and marketing of Christmas trees, and how much injury was done by the cutting. This was carried out during the summer of 1911 by Mr. John H. Keyes, a student of the Yale Forest School. It is planned to complete the study during the coming fall and winter, and publish the results.

#### RECOMMENDATIONS.

The most urgent need in carrying forward the educational work of the Forestry Department is an assistant forester. Such an assistant should visit woodland owners, including towns and counties, make detailed plans for applying the principles of forestry, and at intervals inspect such tracts to see how the instructions are being carried out. He could look over waste lands for private owners, make plans for reforestation, supervise the growing of trees in the state nursery, and the distribution and planting of trees. He could also supervise the growing, planting and care of roadside shade trees in coöperation with the Highway Department and the town tree wardens. His duties would also include the carrying out of plans for the management of state forest reservations, the collection of data resulting from demonstration and experimental work, and the publication of such information in bulletins for distribution to woodland owners.

## REFORESTATION.

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### STATE FOREST NURSERY.

In the spring of 1911 a forest nursery was established at North Boscawen. It is on an eastern slope less than a quarter of a mile from the Gerrish railroad station, and covers an acre and a half of ground. The nursery plot, together with a house and barn, are held by the Forestry Commission under a ten-year lease.

White pine is the principal tree grown for reforesting waste land, and the greater part of the nursery is given over to growing this species. Scotch and red pine are also grown for planting on very dry, sandy, or gravelly land; Norway spruce for planting in moister situations, and balsam fir for planting in swampy ground. In small quantities European larch, red oak, white ash and basswood are raised.

### SALE OF NURSERY STOCK.

The state forester is authorized to sell the trees raised in the state nursery upon terms approved by the Forestry Commission to persons who wish to plant them within the state, or to secure trees from other nurseries for the same purpose. The plan pursued has been to issue a circular of information early in the spring on reforesting land, accompanied by a list of the kind of stock which the commission could furnish from the state nursery, or secure from other nurseries, and then to sell only transplanted stock from the state nursery, and to secure from other nurseries whatever seedling stock the commission received requests for and trans-



plants which the state nursery was unable to supply. During the spring planting seasons of 1911 and 1912, besides the shipments made from the state nursery, the commission secured trees for landowners from the following nursery firms:

J. S. Dearborn, Pembroke, N. H.

Keene Forestry Association, Keene, N. H.

North Eastern Forestry Co., New Haven, Conn.

G. L. Mahoney & Co., Saco, Me.

American Forestry Co., South Framingham, Mass.

Concord Electric Co., Concord, N. H.

During the two planting seasons covered by this report, 435,920 trees were distributed by the Forestry Commission, about twenty percent of which were shipped directly from the state nursery, and over eighty percent from commercial nurseries. Whenever possible orders which could not be filled from the state nursery were placed with New Hampshire firms. The following were the average prices charged for the different species during 1911 and 1912:

WHITE PINE.

Seedlings	2 years old	3"-6" high	\$3.00 per 1,000
"	2 " "	5"-8" high	4.00 " "
Transplants	3 " "		6.00 " "
"	4 " "		6.50 " "
"	5 " "		7.00 " "

SCOTCH PINE.

Seedlings	2 years old	\$3.00 per 1,000
Transplants	3 " "	6.00 " "

NORWAY SPRUCE.

Seedlings	2 years old	\$3.00 per 1,000
Transplants	3 " "	6.00 " "

WHITE ASH.

Seedlings	1 year old	\$2.00 per 1,000
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## RESULTS OF FOREST PLANTING.

Every person who received trees from the commission was asked to report on the success of the plantations. Reports were received from over seventy percent of the trees furnished. From these reports and examinations of plantations made by the state forester, it is estimated that about seventy-five percent of the trees set out in 1911 lived and eighty-five percent lived of those planted in 1912. The extreme drought in 1911 killed a great many trees, but most of those planted very early survived the drought. A drought in 1912, immediately following the spring planting season, killed many trees which were planted late. Of twenty-two thousand Scotch and white pine transplants set out on the Walter Harriman Reservation in Warner, the planting of which was carefully supervised, over ninety percent are living.

## PROGRESS AND IMPORTANCE OF REFORESTATION.

Forest planting in New Hampshire began about 1868, but its progress has been slow, especially up to 1910, when it was estimated that a total of twelve hundred acres of land had been planted to trees. During the past two years the educational work of the Forestry Commission and the activity of local nursery firms have increased the interest in reforestation, and about six hundred acres more have been planted. At present, therefore, forty-four years since the first tree plantation was set out, there is only about eighteen hundred acres of planted forest in the state.

The fact that land is not reforested on a large scale by private owners is not due in any large degree to lack of knowledge on the subject, nor to doubt about the success of the undertaking. It is due almost entirely to the length of time required to produce a timber crop and the risks that such an investment must carry. An illustration is afforded by the fact that the number of

trees planted in 1912 was considerably less than in 1911, due to an agitation throughout the state for an increase in the taxation value of property. Aside from changes in taxation methods, the owner must carry the risks to his original investment of such destructive agencies as fire and insects. It is interesting in this connection to note that most of the planting in New Hampshire has been done by small owners whose initial investment is not always a cash charge. While it may be apparent to the private owner that money invested in reforesting land will pay a fair rate of interest, it is evident to him that the returns are delayed and the risk is considerable.

It is nevertheless very important to the state that waste and cut-over land should be reforested on a large scale. It has been estimated by the United States Department of Agriculture that about sixty percent of the land surface in New Hampshire is better suited to the growth of trees than any other crop. Some of this land is too sandy to farm profitably, but this is only a small percent lying in a few river valleys, lake basins and along the coast. By far the greater part of it has rich soil, but is unfit for farming on account of its steep slope or rocky surface. The tree growth on our non-agricultural land is therefore rapid, but, due to the insufficient natural seeding of valuable trees, and to fires which invariably encourage inferior growth, the stand of timber on most of it does not approach in quantity or quality the maximum timber-producing capacity of the soil. Furthermore, the many New Hampshire sawmills and wood-using industries have cut heavily into our second growth forests, and are more and more obliged to secure raw material from without the state. These industries represent many millions of dollars of invested capital, and pay every week hundreds of thousands of dollars in wages. The reforesting of our cut-over and waste lands with valuable trees is therefore important, not only to make the best possible use of these lands, but also to insure the permanence of our wood-using industries.

## STATE AID IN REFORESTING LAND.

The commission has studied the methods used by other states to promote reforestation, with the view of determining the best way in which New Hampshire can offer substantial encouragement with the least expense to the state. Roughly, these methods may be divided into three classes: 1. The state gives prizes, bounties or tax rebates for planted land. 2. The state sells trees or furnishes them free of charge to landowners, and publishes bulletins on how to reforest land. 3. The state purchases land, reforests it and then sells it back to the owner at the original cost, plus the cost of planting with interest.

*1. Prizes, bounties, and tax rebates.*

Experience has shown that none of these methods are satisfactory. Many states have passed laws of this kind, but in most of them the resulting increase in forest planting has been insignificant. In the few states where people have taken advantage of such laws the cost to the state has been very high for the number of acres of planted forest successfully established. New Hampshire has tried the plan of rebating, for a period of thirty years, part of the taxes on land planted to trees. This law has been on the statute books since 1903, and the Forestry Commission has given it wide publicity, but it has had practically no effect on reforestation.

*2. Selling or giving away trees with published instructions.*

The state either raises the trees or buys them from a commercial nursery and sells them to landowners at the cost price. In a few states trees are furnished free of charge. Both of these plans are open to the objection that unless the operation is large enough to warrant paying for expert supervision the owner must depend on printed pamphlets for information about the kinds of

trees best adapted to his soil conditions and the methods of planting. Such instructions carried out carefully have resulted in a fair degree of success, but the neglect of details which an inexperienced owner may think unimportant will sometimes result in partial or entire failure. This is discouraging to the owner and to others in the vicinity who may have become interested in reforestation. New Hampshire has for several years sold trees, and the results are discussed in the first part of this chapter. The commission believes that this should be continued, and that to encourage beginners a limited number of trees might well be furnished to owners free of charge after field examinations have been made and the owners given personal instruction.

### 3. *State acquisition of land for reforestation.*

This plan was adopted by Massachusetts about four years ago. Briefly, it provides that the state shall acquire tracts of land offered by the owners at prices not to exceed five dollars per acre, and shall reforest the land, protect the timber from fire, and keep an accurate account of the initial and other expenses. At the end of ten years the owner may buy the tract from the state at the original cost plus the cost of reforesting and maintenance with interest for the period, or failing to do this the state may sell the tract to the highest bidder, making restrictions as to the methods of lumbering.

Legislation of this kind has been proposed in New Hampshire for a number of years and the Forestry Commission has therefore had occasion to look into the merits of the plan very carefully. It insures the success of reforestation by giving the state absolute authority over the tracts. If the first planting is not entirely successful the failed places can be replanted. For this reason such a tract would be of great educational value in any community by demonstrating successful methods of forest planting. The disadvantage of the plan is that

the cost to the state is high for the actual amount of land reforested. It is believed that tracts would be offered to the state by many owners without any initial payment. The state would then only plant the land and protect it, and would therefore be able to reforest a greater acreage with the same amount of money, and the educational purposes would be served even better.

#### RECOMMENDATIONS.

After carefully considering the results accomplished under the present law, and the methods used by other states to encourage reforestation, the commission recommends a combination of the second and third plans, as follows:

1. That the present system of selling trees from the state nursery and securing trees from commercial nurseries for distribution to landowners within the state be continued, and that educational work along this line be extended to rural schools and similar institutions.

2. That the state forester be authorized to make field examinations of specified tracts upon application from landowners, and to furnish such owners with complete plans for reforesting said tracts free of charge, and that upon the recommendation of the state forester the Forestry Commission give said owner not over two thousand trees for planting according to the specified plans.

3. That whenever a landowner gives a deed of a tract not to exceed twenty-five acres to the Forestry Commission for reforesting, the commission shall, after an examination of the tract has been made by the state forester and a favorable report filed, authorize the state forester to reforest said tract, protect it from fire and otherwise care for it for a term of ten years; and that at the expiration of this period the owner be allowed an option to purchase said tract from the state at the actual cost of improvement with interest for the period.

## STATE AND NATIONAL FORESTS.

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### PUBLIC OWNERSHIP OF FOREST LAND IN NEW HAMPSHIRE.

During the past two years, marked progress has been made in the acquisition of forest land by the public. The agitation of more than a decade for national forests in the Eastern States culminated in the passage of the Weeks Act by Congress; and the action of the United States Forest Service and the Geological Survey in carrying it out insures the government ownership and management of a considerable portion of the White Mountain Region. In the mean time, the General Court of New Hampshire provided for the purchase of the Crawford Notch, and a small tract in the central part of the state was received by gift.

New Hampshire is also fortunate in having a number of places of rare natural beauty acquired by public spirited associations. The recent work of the Society for the Protection of New Hampshire Forests deserves especial mention. Not only was the society largely responsible for the passage of the Crawford Notch legislation, but by private subscription it has purchased six hundred and seventy-five acres on the north slopes of Sunapee Mountain, and one hundred and forty-eight acres at the head of the Lost River. The natural beauty of these places will be preserved, and the society has also built and improved trails, bridges, lookout points and camp sites for the convenience of the public. The Appalachian Mountain Club has been acquiring similar sites throughout New Hampshire for some years, and

now has twelve tracts varying in size from one to three hundred acres.

#### THE WHITE MOUNTAIN NATIONAL FOREST.

Three tracts, aggregating seventy thousand acres, will soon become the property of the government, and will be operated as a national forest. As this report is being published, the deeds have not passed to the government, as an accurate survey is being made to determine the exact acreage. The largest tract is in Bean's Purchase, and consists of about thirty-four thousand acres of the valley of Wild River east of the Carter Range. The second is about twenty-nine thousand acres on the north slope of the Presidential Range in Gorham, Randolph, Carroll, and Low and Burbank Grant. The smallest comprises seven thousand acres on the north slope of Mt. Garfield in Franconia and Bethlehem. Other tracts will no doubt be acquired within the next few years.

The headquarters for managing the present tracts is Gorham. The policy will be to establish efficient fire protection by building and improving telephone lines, trails and camps, and by coöperating with the state and adjoining timberland owners in the maintenance of patrol and mountain lookout service. When proper fire protective measures are established, a detailed study of the forest conditions will be carried on to determine the reproduction and growth of the more valuable trees, and the best cutting systems to use on different forest types. When these things are determined, cutting contracts will be let for removing mature timber, under regulations made by the Forest Service as to cutting methods and slash disposal. The proper management of large tracts in the White Mountains will be of great benefit, not only in helping conserve the timber supply of the region, but also in showing the methods by which such management can be successfully carried out.



## STATE FORESTS.

The state owns three forest reservations in the southern part, and is acquiring a larger one, the Crawford Notch, in the northern part. The developments for the past two years will be discussed for each tract.

## THE CRAWFORD NOTCH.

For a number of years there has been a feeling among persons interested in New Hampshire's progress in forestry that the state shall acquire and preserve its many spots of rare natural beauty. This feeling found expression in a law passed in 1893 and amended in 1911, permitting the Forestry Commission to acquire such land for public forests, either by purchase or by condemnation proceedings when anyone supplied the funds therefor; so that no cost of purchase accrued to the state. Up to 1911, only three small tracts had thus come under state ownership, and the feeling was growing that the state should take active steps to secure such places by purchase, if necessary. This feeling centered in an organized effort to secure legislation for the state purchase of Crawford Notch. Cutting had been going on for a year or more in the lower part of the Notch, and it was feared the timber would be stripped from the mountain sides and the beauty of the region spoiled. The Society for the Protection of New Hampshire Forests, through its forester, Mr. Philip W. Ayres, did a great deal of work, and is largely responsible for the favorable legislation secured. A discussion of the legal proceedings for the acquisition of the property will be in the Biennial Report of the Attorney-General.

The state will by this act come into possession of about six thousand acres of land, to be managed by the Forestry Commission as a forest reservation and public

park. The commission may cut timber to improve the forest growth, and any timber not needed for forest conservation or to preserve the scenic beauty of the Notch may be removed with the approval of the Governor and Council. The proceeds from timber sales are to be applied toward paying the principal and interest required for the purchase.

No provision is made in the act for protecting timber against fire, and the commission recommends that it be given means so to do. The tract could be looked after well if put under the direct charge of the district chief of the East District, and patrolmen employed during dry weather. One permanent patrolman employed throughout the summer would serve the ends of fire protection and improving the appearance of the property. There are many places along the road where a little judicious trimming out would open up beautiful vistas to travelers. Brush should also be cut and burned near the road to prevent fire starting from smokers in passing teams and automobiles. These things the patrolman could be doing while not on actual patrol duty. Besides this he could improve the paths and post fire notices and guide boards.

There is considerable valuable mature timber on the tract. Under most of it there is a vigorous young growth of soft woods which is being retarded materially by the old timber. It would be advisable to remove this old growth gradually, and under proper regulations for logging, that will prevent the young growth from harm as much as possible, and dispose of the slash to eliminate the danger from fire. It will not be necessary, however, to begin the removal of this timber for several years, and it would be better to wait and find out by example the methods of lumbering and slash disposal that are found to be successful on the national forests in the same region.

## THE WALTER HARRIMAN RESERVATION.

This tract comprises two hundred and ten acres on the south side of Stewart Mink Hill in Warner, a short distance from the birthplace of Gen. Walter Harriman, governor of New Hampshire in 1867-1868. The tract was given to the state by Hon. Joseph R. Leeson, Newton, Mass., a son-in-law of General Harriman. During the summer of 1911, a map and estimate of timber and a plan of management was made. The tract contains a small area of old growth spruce near the top of Stewart Mink Hill, and lower down a mixture of spruce, maple, beech and birch, which gradually merges into a thrifty stand of pure hardwoods, containing a large percent of red oak. There is considerable open land which is seeding up to pine and spruce.

In the spring of 1912, seventeen thousand white pines and five thousand Scotch pines were planted in the open pastures. Also experiments were tried in the reforestation of open land by seeding pine on the land broadcast, and by sowing it in prepared seed spots. It is proposed during the coming winter to make improvement cuttings on certain areas and keep records of the effect on the remaining growth.

## THE HAVEN RESERVATION.

The acquisition of this tract was described in the report of the Forestry Commission for 1903-04. During the summer of 1911, a map was made, together with an estimate of the timber and a plan for improving the forest conditions.

## THE MONADNOCK RESERVATION.

The Forestry Commission deeply regrets the death of Arthur E. Poole of East Jaffrey, who has acted as custodian of both the Monadnock and the Haven Reser-

vations. Mr. Poole was a firm friend of forestry, and gave generously of his time and resources toward the state acquisition of the Monadnock Reservation, as described in the report of the Forestry Commission for 1903-04.

During the summer of 1911, a map, timber estimate, and plan of management was made for this reservation. In the following winter an improvement cutting was made in a very thick, even-aged stand of spruce. Prior to cutting the trees, it was accurately surveyed and the diameters and heights of the trees recorded. The poorer trees were then removed and the better ones allowed to remain, spaced as evenly as practicable. The slash was burned. While the cutting was going on cost figures were kept of all the operations, and the cutting paid for itself in the material removed. From time to time measurements will be taken on this tract to ascertain how much this cutting has increased the growth of the remaining trees.

The conditions around Monadnock Mountain are favorable to the enlargement of the state's present ownership and the extension of forest protection and experiment work begun by the commission. There is land near the present reservation that might be secured at a reasonable price. Furthermore, since the state has constructed a mountain lookout station on Mt. Monadnock and will keep a watchman there in the summer, protective and improvement work can be carried on economically together.

#### THE EXTENSION OF STATE OWNERSHIP.

New Hampshire is particularly fortunate in having a national forest in her White Mountain Region, and in having public-spirited individuals and associations actively interested in the preservation of her forests. Besides, there is a growing feeling for the state acquisition

of forest land, as evidenced by the purchase of Crawford Notch. Nearly all the Eastern States are developing policies of acquiring and managing state forests. The Forestry Commission believes that the best interests of New Hampshire would be served if a systematic plan were adopted for acquiring land rather than depending on the gifts of individuals or the enactment of legislation for specific tracts. Such a plan should take into account the present area and probable extension of forest land owned by the government, the towns, and private societies.

For the present, the plan suggested is to provide an accumulating fund to be used for the purchase and improvement of reservations in different parts of the state, the primary object of which would be to demonstrate methods of practical forestry.

#### A PROBLEM IN STATE CONSERVATION.

BY GEORGE B. LEIGHTON, MEMBER OF THE NEW HAMPSHIRE COMMISSION, DELIVERED AT THE MEETING OF THE SOCIETY FOR THE PROTECTION OF NEW HAMPSHIRE FORESTS, BRETTON WOODS, AUGUST 2, 1911.

*Mr. President, Ladies and Gentlemen:*

It is a pleasure to address you upon a matter of state conservation. The remarks made last evening by the National Forester, Mr. Graves, in which he stated that state forests were necessary as well as national forests, and those made by Governor Bass upon the importance of conserving the resources of the state in forests and in water storage, form a fitting introduction to what I shall say to you. Both of these speakers realized and expressed the importance of the state directly doing what it can in conservation of natural resources.

The state of New Hampshire was, when our people came to it, forest clad. Climatic and rainfall conditions make it as adapted to forest growth as do the soil and climatic conditions make the prairies of the West adapted to the growing of grain. Forest knowledge and forest culture are demanded here, just as agricultural knowledge is in the grain-growing states. If all

the people withdrew from the state it would again become forest clad, but new forest growth can be bettered by intelligent care and protection rather than by leaving nature to work unaided.

The state will have, in time, if present efforts succeed, an imposing forest in Crawford Notch, and I wish to call to mind another tract of land in the state where natural conditions seem ideal for the development of a state forest

It is a hill country embracing the backbone of the state, stretching southward from Lake Sunapee and Mt. Sunapee, on which a tract of land has just been acquired by the Society for the Protection of New Hampshire Forests, some twenty miles to Nubanusit Lake in Nelson and approximating fifteen miles in width. The elevation above sea is from something less than one thousand feet to two thousand feet. The amount of water acreage and water storage in this highland is rather surprising to one who has not observed it. Many ponds and lakes exist, the head waters of rivers of importance to the manufacturing interests of the state. The Ashuelot begins at the Ashuelot ponds of Marlow and Washington and runs diagonally through Cheshire County for forty miles, operating mills in nine towns and villages. The Stoddard ponds are the source of an important branch of the Contoocook. The Contoocook is the motive power of important mills in Peterboro, Bennington, Hillsboro, Henniker and Penacook. The Sugar River receives considerable water from its southern branch which rises in Goshen. As showing the extent of water, it may be said that there is navigable water for a tug, of some eight miles in the Stoddard ponds and, but for a dam, another pond of two miles might be added. Nubanusit Lake is over four miles in length and the water storage here can be largely increased. Although Sunapee is at the north end, so little water flows to it from this tract that it can hardly be considered as being protected by the forests of this region. The mills on Sugar River at Claremont employ a large number of our people. It is rather surprising that, although the state of New Hampshire owns the Connecticut to the west bank, but little of the water power of that stream is utilized in New Hampshire. At Bellows Falls the water power development is entirely in Vermont, and the large power plant at Hinsdale sells, at the present time, all of its power in Vermont and Massachusetts. Quite properly, therefore, is the conservation of the head waters of that river in the hands of the nation. On the other hand, a permanent diminution of the water flow in the Ashuelot and Contoocook is a lessening of

the industrial activity and ability of this state and the flow and storage is not now all that it might be.

The region in question was originally covered with spruce, pine, and hard wood forest. Lumbering is still done, but not profitably on account of inadequate transportation. Considerable areas are pasture lands on which new forest growth is taking hold. From Pitcher Mountain in Stoddard and Black Top in Nelson, one may look over these clumps of forest and the ponds that remind one much of the highlands of Scotland. This aspect much impressed the British ambassador, Mr. Bryce, who visited this region with me last summer. We know that the reforestation of such area unaided is inefficient, and that a forest crop requires a much longer time of growth when unaided by forestry methods.

This region, comprising some three hundred square miles of our state, is now the home of less than two thousand people, who gain a precarious existence because the land is not adapted to agriculture and because the forest crop is not nurtured. While the region is now removed from means of communication and transportation, this condition is being and can be remedied at no great expense. The Nashua and Keene branch of the Boston & Maine passes south of the southern extremity some four miles at Harrisville. The Claremont branch crosses the northern edge and the new west side state road skirts the western boundary, while on the east there is no railway or highway parallel with it for ten miles. Stoddard has been the center of the district, and for some years a considerable cut of lumber was marketed by hauling it over a poor road to Hancock. Nubanusit Lake is reached only at its southern end by highway, but by constructing a modern highway along the shores of Nubanusit, over the slight divide and tapping the present Stoddard-Hancock road, it would seem to be a feasible matter to haul profitably by traction the lumber and forest products to Harrisville. Land within the area under observation is cheap, and much of the land has been cut over. The price is from two to four dollars per acre, unless well covered with growing timber, and then proportionally higher. So we ask the question, should the state not buy a considerable portion of this area and develop thereon a state forest? It would seem not to do so would be simply to neglect a resource of great value directly or indirectly to our people. It would be a mistake to buy too large an area at once, but rather to do so in annual purchases extending over several years. If the state in time owned half of it and took care of it, private interests would

acquire much of the remainder of it for the same purpose. Already there are private holdings whose owners would gladly cooperate in developing a forest area when the example of what can be done is shown by the state on its lands. The tract should be under the Forestry Commission, a forester and a competent corps of woodsmen which our Agricultural College should train. The method of work would be cutting off hard wood to let the existing new growth of spruce and pine develop, seeding, planting and fire protection.

The Forest Commission should be given considerable freedom in the acquisition and disposition of land, for it is quite likely that private individuals might wish to buy tracts that had been put under forestry methods, agreeing to maintain the forest growth under supervision of the state. If such lands could be sold at satisfactory profit, the money could be reinvested in other land and so a larger area developed. Again, small lots on the shores of lakes might be in demand at a comparatively high price when the assurance was given that the surrounding land was to be maintained by the state as a state forest.

The region is one of hills, therefore water runs off after storms rapidly, and for that reason the large area of ponds and lakes should be utilized to the utmost for storage. Whether the present owners of such waters are willing to cooperate to develop the maximum storage, utilizing it for the benefit of all interested, would remain to be determined, and if such was found not to be the case, no doubt other means would suggest themselves of maintaining these reservoirs. It may be desirable for this state to consider the question of the control of the water supply in a way similar to that undertaken in New York, which state has a State Water Supply Commission, established in 1905, and whose duties are to devise plans for the control and maintenance for the progressive development of the water powers of the state under state ownership for the public use and benefit and for the increase of the public revenue.

In a recent number of American Forestry an example is cited of the Cumberland River as a water-shed where floods have increased due to removal of the forest, fires and neglect. The area has become more like a roof than it was. On the other hand, the Red River is cited as an area where the ground has been broken up by tillage so that the roof characteristics have diminished and so have the floods. While opportunity has not been given for an actual survey here, one must believe from observation that the water storage in the area can be largely increased by forestry and conservation methods. We want to



hold back the waters that go over the dams in February and March, and let that water go down in July and August, when it is needed to turn the wheels.

Considering the general prosperity of a conserved forest region as compared to a neglected hill country, we may refer to the recent report of the Royal Scottish Arboricultural Society on the afforestation of Scotland. The commission speaks of a certain valley containing sixty thousand acres of plantable ground containing only nine hundred acres now tilled. The Scotch estimate is ten acres of tillage to a family, so that there are now but ninety families supported on the land, but with afforestation over the area, in twenty years the commission estimates that two hundred families would find support, and after forty years six hundred families. The scheme suggests the creation of a resident population whose interests will be connected with forestry. The Black Forest of Germany is a manufacturing district. Winter work in the woods would keep inhabitants on the farms of the region in summer and furnish a home market for hay and produce. This condition exists now in Northern New Hampshire and Maine. Herein may we not find a suggestion as to what applied forestry would do for this sparsely settled area in New Hampshire.

Again, as indicating what scientific methods may do to accelerate forestation on lands which are seeding themselves, we may refer to the article on Abandoned Pastures in Southern New England, in the Forestry Quarterly for June.

Vermont has two state forests of small area which were gifts—the Downer forest of three hundred and ten acres and the Jones forest of five hundred acres. We have three areas of forest land belonging to the state—an area on the east side, but not the top, of Monadnock of six hundred acres in the town of Jaffrey, another tract in Jaffrey of sixty acres, known as the Haven gift, and the Walter Harriman Reservation of two hundred acres in Warner. The scope and object of a New Hampshire forest as herein suggested is far greater, because not only would the state have a self-supporting state forest in time, which would be a tremendous asset, but the economic power of the state would be increased by water storage and conservation. This idea is but a personal suggestion. Purposely has the writer refrained from conferring with his associate commissioners or the state forester, that they should be in no way bound or compromised, but that their endorsement might, if merited, come after examination.

Timberlands have proven a safe investment, almost universally, whether acquired by individuals, corporations or states, for while the tree-growth is slow, it is dependable. Timber value is increasing, therefore such an investment by the state would win and be safe and no other body is capable of protecting the public welfare. It is New Hampshire's natural resource.

Before closing, a word may be said about the financial side, and then the idea must rest on its merits.

We know that white pine will pay at least four percent compound interest to plant, and in addition to pine, it is quite possible that the Norway spruces may be found a desirable tree for afforestation in this district. It is known to succeed where native spruces do, and from the observations made at the Billings Farm at Woodstock, Vermont, as stated in the Massachusetts report on agriculture for 1909, it would seem to give promise of quicker returns. We know that in the area there is much marketable hard wood under favorable transportation conditions. In a forest tract of this magnitude it would be possible to utilize the by-products in a way that cannot now be done, for there would be a steady supply of some magnitude to furnish the material for a plant. By by-products, I refer to the manufacture of charcoal in kilns and the production of creosote, wood alcohol, and the utilization of sawdust. Suppose the state authorized the issue of five hundred thousand dollar fifty-year bonds at the rate of fifty thousand dollars a year. In this way some ten thousand acres a year could be acquired and put under forestry conditions. The total acquisition would approximate fifty thousand acres in a district embracing two hundred thousand less the water acreage. Private owners could be relied upon to take care of another fifty thousand acres. Unless the forestry calculations are all wrong, state forest should take care of itself and the interest in twenty years and be able to pay off something on the principal in the later years if need be.

## STATEMENT OF EXPENSES OF THE FORESTRY COMMISSION.

(From September 1, 1910, to August 31, 1912.)

### *I. Appropriation made in 1909 for year ending August 31, 1911.*

In 1909 an appropriation of \$8,000 was made to cover the general expenses of the Forestry Commission for the

year ending August 31, 1911. This appropriation was used for the general expenses of the department up to the time the forestry law of 1911 took effect, April 15, 1911. After that time there were specific appropriations for the different branches of forestry work, and the balance remaining in the 1909 appropriation was used for such general forestry work as was approved by the state auditor. The following is an itemized statement of the expenditures:

Expenses of commissioners (Sept. 1, 1910, to April 15, 1911).....	\$55.60
State forester, salary (Sept. 1, 1910, to April 15, 1911) .....	1,229.17
State forester, field expenses (Sept. 1, 1910, to April 15, 1911).....	246.79
State forester, transportation (Sept. 1, 1910, to April 15, 1911).....	60.00
Clerk, salary (Sept. 1, 1910, to April 15, 1911)	487.50
Office supplies and expenses (Sept. 1, 1910, to April 15, 1911).....	192.78
Printing blanks (Sept. 1, 1910, to April 15, 1911) .....	13.75
Freight, express and trucking (Sept. 1, 1910, to April 15, 1911).....	29.60
Telephone and telegraph service (Sept. 1, 1910, to April 15, 1911).....	119.35
Postage (Sept. 1, 1910, to April 15, 1911)....	90.00
Forest fire expenses, paid to towns (Sept. 1, 1910, to April 15, 1911).....	347.05
Technical books and equipment (Sept. 1, 1910, to April 15, 1911).....	24.50
Biennial report for 1909 and 1910:	
Printing, paper and binding.....	\$376.00
Tabular work and maps.....	177.52
	<hr/>
	553.52

Forest fire notices.....	403.65
Office furniture .....	95.85
Drafting supplies.....	76.79
Wages of draftsman, making maps.....	257.00
Printed reply postals for patrolmen.....	125.00
Report blanks for field employees.....	64.12
Badges for deputy forest fire wardens.....	270.00
Student assistants, scientific investigations and mapping state reservations.....	869.31
Equipping forest nursery.....	1,896.92
Study of wood-using industries.....	250.00
Exhibits at fairs.....	41.76
Extra clerk hire, May 1 to August 1, 1911....	199.99
	<hr/>
Total appropriation.....	\$8,000.00
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## II. Appropriation from April 15 to August 31, 1911.

The appropriation made to carry the new law into effect, from the date of passage to the end of the fiscal year, was divided into four accounts.

### I. Salaries and departmental expenses:

Expenses of commissioners.....	\$32.20
State forester, salary.....	833.33
State forester, field expense.....	174.87
State forester, transportation.....	30.00
Clerk, salary.....	300.00
Clerk, travelling expenses.....	15.40
Salaries and expenses of four district chiefs for four months.....	1,365.48
Office supplies and expense.....	171.99
Office furniture .....	28.41
Printing blanks.....	616.10
Freight, express and trucking.....	44.91
Telephone and telegraph service.....	155.68
Postage .....	226.16
Technical books.....	116.59
Drafting supplies.....	68.92

Signs for state forest reservations.....	\$17.00
Field equipment.....	7.50
Gas for lantern.....	1.75
	<hr/>
Total expenditure.....	\$4,206.29
Unexpended balance.....	3.71
	<hr/>
Total appropriation.....	\$4,210.00
	<hr/> <hr/>
2. Reimbursing towns for fighting forest fires .....	\$3,215.00
	<hr/>
Total appropriation.....	\$3,215.00
	<hr/> <hr/>
3. Forest fire prevention:	
Acquisition of nine mountain lookout stations .....	\$2,059.45
Repair of mountain lookout stations...	53.90
Additional equipment of mountain lookout stations.....	318.76
Lookout watchmen, wages.....	2,221.74
Lookout watchmen, expenses.....	13.05
Building and operating temporary lookout stations.....	194.75
Wages of temporary patrolmen em- ployed in southern New Hampshire during drought.....	698.00
Fire warning advertisement.....	7.86
Tool box and supplies of fire-fighting tools .....	25.48
Fire maps .....	7.01
	<hr/>
Total appropriation.....	\$5,600.00
	<hr/> <hr/>
4. Operating state forest nursery.....	\$500.00
	<hr/>
Total appropriation.....	\$500.00
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*III. Appropriation for year ending August 31, 1912.*

The appropriation from September 1, 1911, to August 31, 1912, was divided into eleven accounts.

1. State forester, salary.....	\$2,500.00
2. State forester, travelling expenses.....	\$499.99
Unexpended balance .....	0.01
Total appropriation.....	<u>\$500.00</u>
3. Clerk, salary .....	<u>900.00</u>
4. Salary and expenses of four district chiefs employed six months.....	\$2,093.28
Unexpended balance.....	6.72
Total appropriation.....	<u>\$2,100.00</u>
5. Incidentals:	
Expenses of commissioners.....	\$39.60
Office supplies and expenses.....	126.16
Office furniture.....	8.50
Freight, express and trucking.....	91.03
Telephone and telegraph service.....	197.83
Postage .....	264.50
Drafting supplies.....	23.29
Extra clerk hire.....	223.31
Fair exhibits.....	161.97
Maps of state reservations.....	17.67
Photographic supplies .....	25.68
Shelving room in basement of State House .....	19.27
Log rule.....	7.25
Total expenditure .....	<u>\$1,206.06</u>
Refunded on account "Expenses of commissioners" paid from previous appropriation .....	6.06
Total appropriation.....	<u>\$1,200.00</u>

6. Printing blanks.....	\$499.73
Unexpended balance.....	0.27
Total appropriation.....	<u>\$500.00</u>
7. Reimbursing towns for fighting forest fires .....	<u>\$4,500.00</u>
8. State forest nursery:	
Expenses of operation.....	\$1,361.32
Sale of nursery stock.....	561.32
Total appropriation.....	<u>\$800.00</u>
9. Mountain lookout stations:	
Watchmen, wages.....	\$2,306.89
Watchmen, expenses (telephoning, etc.)	76.87
Repair of lookout stations.....	91.70
Labor in construction of new stations	228.03
Expenses in construction of new sta- tions .....	202.32
Supplies for construction of two new stations .....	94.19
Total appropriation.....	<u>\$3,000.00</u>
10. Forest fire warden conferences:	
Expenses for 10 conferences.....	\$479.23
Unexpended balance.....	520.77
Total appropriation.....	<u>\$1,000.00</u>
11. Forest fire prevention:	
Operating temporary lookout stations	\$169.38
Construction and repair of temporary lookout stations.....	62.65
Wages of temporary patrolmen em- ployed in southern New Hampshire during drought.....	350.50
Improvement work on federal patrol routes .....	14.88

Making maps for lookout stations:	
Wages of draftsman.....	422.89
Travelling expenses.....	159.32
Supplies.....	120.92
Wages of draftsman.....	188.60
Making state, district, and town maps:	
Travelling expenses.....	13.39
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Total expenditures.....	\$1,502.53
Unexpended balance.....	0.33
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Available fund.....	\$1,502.86
Refunded on account "Forest fire prevention," paid from previous appropriation.....	
	2.86
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Total appropriation.....	<u>\$1,500.00</u>

FINANCIAL STATEMENT OF MONEY RECEIVED FROM ROBERT  
E. FAULKNER.

During Mr. Faulkner's term as secretary of the commission in 1907 and 1908, he placed his salary at the disposal of the commission for the promotion of forestry work. A statement was made in the last biennial report of the receipts and expenditures up to August 31, 1910. The following statement covers the final disposition of the fund:

Balance on hand, September 1, 1910.....	\$699.78
Received from state of New Hampshire for equipment on Mt. Kearsarge.....	253.39
Printing extra copies of Biennial Report.....	\$36.47
Exhibits at fairs, 1910.....	136.18
Expenses of Bretton Woods Conference, 1910.....	54.50
Printing circulars on the gathering of pine seed.....	7.50



Lookout stations .....	87.02	
Lantern slides.....	15.30	
Maps of reservations and lookout stations .....	200.11	
Purchase of nursery stock and re- forestation land on Walter Harri- man Reservation .....	242.01	
Additional assistance to state forest nursery .....	99.10	
Clerical work .....	74.98	
	<u>\$953.17</u>	<u>\$953.17</u>

## SUMMARY OF RECOMMENDATIONS.

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### I. EXTENSION AND IMPROVEMENT OF THE FOREST FIRE SERVICE.

It is recommended:

1. *District Organization.* That the district chiefs be employed at all times during the year, when their services are in demand to supervise fire protective work, and that they be paid entirely by the state at the rate of four dollars per day and necessary expenses for the time actually employed.

2. *Lookout Stations.* That the additional lookout stations built in Northern New Hampshire be taken over and operated by the state; that lookouts be built in the southern part of the state; that temporary stations be equipped for use in times of extreme drought; and that suitable maps be made for use on all stations.

3. *Coöperation.* That coöperation be continued with the United States Forest Service and the New Hampshire Timberland Owners' Association for protection of forests in the northern part of the state; that coöperation be continued and extended with societies throughout the state to aid the fire service; and that a special effort be directed to secure the direct coöperation of woodland owners in Southern New Hampshire.

4. *Town Forest Fire Organization.* That the patrol service be continued and increased so that towns in Central and Southern New Hampshire, which do not benefit by the work of the Forest Service and the Timberland Owners' Association, can have the services of patrolmen temporarily during very dry weather; and that the towns be

encouraged to purchase sufficient tools and apparatus for fighting forest fires.

5. *Prevention of Slash Fires.* That on all new lumbering operations the owner or operator be required to leave a strip fifty feet wide clear of slash next to the highways and railroad rights of way; and that wherever bushes are cut along public highways the brush be burned or otherwise disposed of under the supervision or approval of the forest fire warden.

6. *Railroad Fires.*

(a) That all companies operating railroad locomotives where oil is not used for fuel be required to use satisfactory spark arresters, maintain patrols at dangerous places during times of drought, clear brush and inflammable material, and maintain fire lines parallel to the track at not less than one hundred feet from the rail.

(b) That in carrying out this work the employees of a railroad be empowered to enter upon private property and construct and maintain such fire lines without action for trespass.

## II. EDUCATIONAL AND SCIENTIFIC WORK.

It is recommended:

1. That an assistant be employed to help the state forester in carrying out the following work:

(a) Examining woodlots and timber tracts belonging to towns, counties and individuals; giving advice and making plans for the proper management of such tracts.

(b) Raising trees in the state nursery for reforestation land, and shade trees for planting along highways.

(c) Managing and carrying on experimental work on the state forest reservations.

(d) Giving exhibits at fairs.

(e) Making state, district, town and lookout maps.

(f) Collecting data for educational bulletins.

2. That an annual appropriation be made to enable the Forestry Commission to carry on scientific field studies on

the rate of growth of trees and forest types, and other investigations necessary as a basis for a fair system of forest taxation.

### III. REFORESTATION.

It is recommended :

1. That the present system of selling trees from the state nursery and securing trees from commercial nurseries for distribution to landowners within the state be continued, and that educational work along this line be extended to rural schools and similar institutions.

2. That the state forester be authorized to make field examinations of specified tracts upon application from landowners, and to furnish such owners with complete plans for reforesting said tracts free of charge, and that upon the recommendation of the state forester, the Forestry Commission give said owner not over two thousand trees for planting according to the specified plans.

3. That whenever a landowner gives a deed of a tract not to exceed twenty-five acres to the Forestry Commission for reforesting, the commission shall, after an examination of the tracts has been made by the state forester and a favorable report filed, authorize the state forester to reforest said tract, protect it from fire and otherwise care for it for a term of ten years; and that at the expiration of this period the owner be allowed an option to purchase said tract from the state at the actual cost of improvement with interest for the period.

### IV. STATE FORESTS.

It is recommended :

That an appropriation be made to enable the Forestry Commission to carry on improvement and experimental work on the present state forest reservations, and acquire, with the approval of the Governor and Council, tracts in different parts of the state for demonstrating the principles of forestry.

## FOREST LAWS.

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### AN ACT TO IMPROVE THE STATE SYSTEM OF FOREST PROTECTION.

(Chapter 128, Laws of 1909, as amended in 1911.)

SECTION 1. On the first day of May, 1909, the Governor, with the advice of the Council, shall appoint a Forestry Commission of three members, one of whom shall hold office for one year, one for two years, and one for three years, and thereafter shall appoint their successors for terms of three years each; the said commissioners to serve without compensation, but to receive for their legitimate expenses in the exercise of their duties such sums as the Governor and Council shall audit and approve, to be paid from the treasury upon warrant of the Governor.

SECT. 2. The Forestry Commission shall appoint a state forester to serve at the will of the commission at a salary to be fixed by them, not exceeding \$2,500 a year. The state forester shall, under the supervision of the Forestry Commission, execute all matters pertaining to forestry within the jurisdiction of the state, and shall be allowed reasonable travelling, field expenses and office expenses in the necessary performance of his official duties. It shall be the duty of the state forester to direct, aid and cooperate with all district chiefs, forest fire wardens and other employees of the state as provided for in this act, and see that they take such action as is authorized by law to prevent and extinguish forest fires and to do other work which the Forestry Commission may undertake for the protection, improvement and extension of forests. He shall, as far as his other duties may permit, carry on an educational course

of lectures within the state, and may conduct exhibits on forestry at fairs within the state. He may, under the direction of the Forestry Commission, conduct investigations within the state on forestry matters and publish for distribution literature of scientific or general interest pertaining thereto. He shall, under the direction of the Forestry Commission, prepare biennially a report to the Governor on the progress and condition of state forest work and recommend therein plans for improving the state system of forest protection, management, replacement and extension. Such report shall contain an itemized statement of all expenses incurred or authorized by the state forester or by the Forestry Commission.

SECT. 3. The state forester shall, upon request and whenever he deems it essential to the best interests of the people of the state, cooperate with counties, towns, corporations, and individuals in preparing plans for the protection, management, and replacement of trees, woodlots, and timber tracts, on consideration and under an agreement that the parties obtaining such assistance pay his field expenses while he is employed in preparing said plans.

SECT. 4. The selectmen of all towns and the mayors of all cities shall, and other citizens may, as soon as may be, after this act takes effect, recommend to the state forester the names of such persons as may in their estimation be fit to fill the offices of forest fire warden and deputy forest fire warden in their respective towns and cities. After investigation the state forester may choose and appoint from the persons recommended, as above prescribed, not more than one competent person in each town or city to be the forest fire warden for said town or city and such deputy forest fire wardens as he deems necessary. Upon the appointment of a forest fire warden by the state forester in any town or city, the term of office of the forest fire warden then or theretofore acting in said city or town shall immediately cease, and the new appointee or appointees shall thereafter serve for one year, or until a

successor is appointed as hereinbefore provided. The state forester shall have the power in the exercise of his discretion to remove any forest fire warden or deputy forest fire warden from office. Upon the termination in any manner of the term of office of any forest fire warden, or deputy forest fire warden, a successor shall be appointed in the manner hereinbefore provided for the appointment of such officers originally. Forest fire wardens and deputy forest fire wardens, themselves, or some agent or agents designated by them, shall, when directed by the state forester, patrol the woods in their respective cities or towns, warning persons who traverse the woods, campers, hunters, fishermen and others, about lighting and extinguishing fires. They shall post extracts from the fire laws, and other notices sent them by the state forester, along the highways, along streams and waters frequented by tourists and others, at camp sites, and in other public places. If, in or near woodlands, any person, other than the owner of said land or his agents acting under his direction, shall build a fire when warned not to do so by an authorized official, or shall fail to extinguish a fire when ordered to do so by an authorized official he may be arrested by such official without a warrant.

SECT. 5. In unincorporated places the state forester may appoint a forest fire warden and one or more deputy forest fire wardens to have the same powers and the same duties as the town forest fire wardens. When so appointed by the state forester, said forest fire wardens and deputy forest fire wardens shall succeed the present incumbent or incumbents, if any. The state forester shall have the power to remove said forest fire wardens and deputy forest fire wardens from office, at his discretion.

SECT. 6. The state forester shall, under the direction of the Forestry Commission, divide the state into not more than four districts according to watersheds, and may appoint a district chief in each district. Said district chief shall serve at the will of the state forester, not more than

eight months in any one year, at a daily wage not exceeding \$3.00 per day and necessary expenses. It shall be the duty of the district chief to assist the state forester in directing and aiding all forest fire wardens and deputy forest fire wardens in his district in the performance of their duties, and to perform such duties as the state forester and Forestry Commission may direct in the protection, improvement, and extension of forests.

SECT. 7. It shall be the duty of the forest fire warden and deputy fire warden to extinguish all brush and forest fires occurring in his town, and either of them may call such assistance as he deems necessary to assist him in so doing, and may require the use of wagons, tools, horses, etc., for that purpose, but such authority shall not interfere with the authority of chiefs of city fire departments. If any persons fails to respond to the warden's call for his assistance or the use of his property, he shall be fined not exceeding ten dollars for each offense. Forest fire wardens and deputy forest fire wardens in towns and unincorporated places shall be allowed for their services such remuneration as may be fixed by the Forestry Commission and the state forester. The owners of all property required by the forest fire warden or deputy forest fire warden in the extinguishment of a forest or brush fire shall receive reasonable compensation therefor.

SECT. 8. In case the forest fire warden or deputy forest fire warden and the persons summoned to assist him or furnish the use of property shall fail to agree upon the terms of compensation at the time or after the required service has been rendered, the dispute shall be referred to the commissioners of the county in which the city or town is located, for final settlement.

SECT. 9. The expenses of fighting forest and brush fires in towns and cities and other expenses lawfully incurred by forest fire wardens and deputy forest fire wardens of said towns and cities in preventing forest fires shall be borne equally by the town or city and by the state.



The forest fire warden shall render to the selectmen or the mayor, as the case may be, a statement of said expenses within one month of the date they are incurred, which said bill shall show in detail the amount and character of the services performed, the exact duration thereof, and all disbursements made by said wardens, and must bear the approval of the forest fire warden, and the approval also of the deputy forest fire warden, if said expenses were incurred by the authority of said deputy forest fire warden; said bill shall be audited, and if approved by the selectmen of the town or mayor of the city wherein such services were incurred, shall be paid on the order of the selectmen by the town or city treasurer. A duplicate bill, showing that the same has been audited and paid by the town, shall be filed by the selectmen or the mayor with the state forester, who shall draw his order on the state treasurer in favor of said town or city for the portion of said bill for which the state is liable in accordance with the provisions of this section.

SECT. 10. The forest fire wardens and the deputy forest fire wardens in unincorporated places shall render to the state forester a statement of such expenses as they have lawfully incurred under this act in fighting or preventing fires in woodlands within one month of the date upon which such expenses are incurred. The aforesaid statement shall show in detail the amount and character of the services performed, the exact duration thereof, and all disbursements so made by the forest fire warden, and the deputy forest fire warden, if said expenses were incurred by the authority of said deputy forest fire warden. The aforesaid statement shall be audited by the state forester and if by him approved he shall draw an order upon the state treasurer for the same. The expenses incurred in fighting forest and brush fires and other expenses lawfully incurred by a forest fire warden or a deputy forest fire warden in preventing forest fires in an unincorporated place shall be borne equally by the state and said unincor-

porated place; but the total expense shall be paid in the first instance from the state treasury, and one half thereof shall be added to the tax assessed the following year against said place in the same manner as is provided by chapter 62 of the Public Statutes for the assessment of taxes in unincorporated places generally.

SECT. 11. Forest fire wardens and deputy forest fire wardens shall make reports to the district chief of the district in which they are located or to the state forester at such time and in such form as the state forester may require. If a warden has any reason to believe that any forest or brush fire in his city or town was caused in violation of statute he shall report to the state forester all the facts coming within his knowledge. The state forester may then bring the facts before the attorney-general of the state, who, if the facts as reported seem to him sufficient, shall take action to recover the penalty fixed by statute for such violation.

SECT. 12. No person shall kindle a fire upon public land without permission first had from the Forestry Commission, the state forester, district chief, forest fire warden, deputy forest fire warden, or from the official caretaker of such public land. No person shall kindle a fire upon the land of another without permission first had from the owner thereof or from the owner's agent.

SECT. 13. Between the first day of April and the first day of November, inclusive, of each year, no person shall kindle a fire or burn brush in or near woodland without the written permission of the forest fire warden or presence of the forest fire warden or person appointed to represent him.

SECT. 14. Fires kindled by throwing down a lighted match, cigar, or other burning substance, shall be deemed within the provisions of sections 12 and 13, and every person violating any provision of said sections shall be fined not more than two hundred dollars, or imprisoned not more than sixty days, or both.

SECT. 15. The state forester, or the forest fire warden, or the deputy forest fire warden, may arrest, without a warrant, any person or persons taken by him in the act of violating any of the laws for the protection of forest lands, and bring such person or persons forthwith before a justice of the peace or other justice having jurisdiction, who shall proceed without delay to dispose of the matter as justice may require.

SECT. 16. Every person who shall set fire on any land, that shall run upon the land of any other person, shall pay to the owner all damages done by such fire.

SECT. 17. If any forest fire warden or deputy forest fire warden provided for in this act shall wilfully neglect or refuse to perform the duties prescribed for him he shall forfeit not less than \$100 nor more than \$500, to be recovered in an action for debt, upon complaint of the Forestry Commission, and all forfeitures so recovered shall be paid into the state treasury.

SECT. 18. It shall be the duty of any person who discovers a forest or brush fire not under control or supervision of some person, to extinguish it or report it immediately to the forest fire warden or deputy forest fire warden or official in charge of forest protection, and failure so to do shall be punished by a forfeiture not exceeding ten dollars to be recovered upon the complaint of the warden.

SECT. 19. All moneys received from fines imposed under and by virtue of the provisions of this act shall be paid to the state treasurer and kept by him as a separate fund, to be paid out by him upon the requisition of the state forester, for use in connection with the prevention and suppression of forest fires.

SECT. 20. Whenever any person or persons shall supply the necessary funds therefor, so that no cost or expense shall accrue to the state, the Forestry Commission is hereby authorized to buy any tract of land and devote the same to the purposes of a public reservation. If they cannot agree with the owners thereof as to the price, they may con-

demn the same under the powers of eminent domain, and the value shall be determined as in the case of lands taken for highways, with the same rights of appeal and jury trial. On the payment of the value as finally determined, the land so taken shall be vested in the state, and forever held for the purposes of a public reservation. The persons furnishing the money to buy said land shall be at liberty to lay out roads and paths on the land, and otherwise improve the same under the direction of the Forestry Commission, and the tract shall at all times be open to the use of the public. The Forestry Commission may take means for the protection of such reservation from forest fire, and, as far as compatible with the wishes of the donor, may plant and remove trees and otherwise improve the forest conditions.

The commission is empowered to receive in the name of th state free gifts of land for the purposes of forestry, in such manner that no cost of purchase shall accrue to the state, and may arrange for the registration of necessary papers, map and survey the land, protect it from fire, plant, cut and otherwise improve the forests as it is advisable within the limits of the appropriation.

The commission is empowered to purchase, with the consent of the Governor and Council, suitable tracts of land for use in demonstrating the principles of forestry, and make provisions for the management of the same, as is advisable within the limits of the appropriation.

All revenue derived from the sale of forest products from state land shall revert to the state treasury, except the revenue derived from the state nursery, which shall be reinvested in the state nursery by the Forestry Commission.

SECT. 21. The sum of four thousand dollars is hereby appropriated for the purpose of carrying into effect the purposes of this act for the year ending August 31, 1909.

SECT. 22. Chapter 44 of the session laws of 1893 and chapter 97 of the session laws of 1905 are hereby repealed.

SECT. 23. The state forester, under the supervision of the Forestry Commission, is hereby empowered to acquire

in the name of the state suitable land and maintain the same as a state forest nursery. He shall raise seedling trees of useful varieties for planting and shall, on terms approved by the commission, sell said seedling trees to persons who desire to plant them within the state. He may, under the supervision of the commission, enter into agreement with persons or institutions to grow seedling trees to be disposed of as above prescribed if the commission deems it expedient so to do.

SECT. 24. The state forester, with the consent of the Forestry Commission, is empowered to purchase in the name of the state the equipment of the present mountain lookout stations and to maintain such stations thereafter, and to establish and maintain additional mountain lookout stations connected by telephone lines to be used for the discovery and control of forest fires, and shall have the right to receive and hold in the name of the state, gifts of land for observatory sites and rights of way for paths and telephone lines. If observatory sites or rights of way necessary for the maintenance and effective operation of lookout stations cannot be acquired by gift or purchase, the Forestry Commission shall have the right to acquire the same under the power of eminent domain, and the value thereof shall be determined as in the case of land taken for highways, with the same rights of appeal and jury trial.

SECT. 25. The state forester, under the direction of the Forestry Commission, may call annual conferences of the forest fire wardens and other employees of the Forestry Department in different sections of the state for the purpose of improving the service. Not more than ten such meetings shall be held within one fiscal year and not more than one meeting shall be held for the wardens of any one section within one fiscal year. Those summoned by the state forester shall be allowed their travelling expenses in attending such conferences. He may, with the consent of the Forestry Commission, secure the attendance at such

conferences of expert foresters from without the state, the said experts to be paid their necessary travelling expenses.

SECT. 26. For the purpose of prevention of fire, the state forester may establish at advantageous points throughout the state supply stations for tools and apparatus used in fire fighting and provisions necessary to men employed; make proper maps for the use of district chiefs and forest fire wardens, build fire trails and fire lines; employ paid patrols at suitable points and at necessary times, and use other means as seem advisable to the commission within the limits of the appropriations.

#### APPROPRIATIONS.

The following sums are hereby appropriated for carrying out the provisions of this act from the date this act takes effect until August 31, 1911, to wit:

For salaries and departmental expenses, \$4,210.

For reimbursing towns and cities for the state's share of expense incurred by them in fighting and preventing forest and brush fires, and to defray the expense incurred by the state in fighting and preventing forest and brush fires in unincorporated places, \$3,215.

For the establishment and maintenance of a state nursery, \$500

For forest fire prevention, including the establishment and maintenance of mountain lookout stations, \$5,600.

The following sums are hereby appropriated for carrying out the provisions of this act for the year ending August 31, 1912, to wit:

For salaries and departmental expenses, \$7,700.

For reimbursing towns and cities for the state's share of the expense incurred by them in fighting and preventing forest and brush fires, and to defray the expense incurred by the state in fighting and preventing forest and brush fires in unincorporated places, \$4,500.

For the maintenance of a state nursery, \$800.

For forest fire prevention, \$5,500.

The following sums are hereby appropriated for carrying out the provisions of this act for the year ending August 31, 1913, to wit:

For salaries and departmental expenses, \$8,200.

For reimbursing towns and cities for the state's share of expense incurred by them in fighting and preventing brush fires, and to defray the expense incurred by the state in fighting and preventing forest and brush fires in unincorporated places, \$4,500.

For maintaining a state nursery, \$300.

For forest fire prevention, \$5,500.

SECT. 6. All acts and parts of acts inconsistent with this act are hereby repealed. This act shall take effect upon its passage.

Approved April 15, 1911.

## AN ACT TO PROVIDE FOR THE USE OF SPARK ARRESTERS ON PORTABLE STEAM MILLS.

(Laws of 1911.)

SECTION 1. No person, except when the ground is covered with snow, shall operate any portable steam mill unless the same is provided with a suitable spark arrester, approved by the state forester. Such approval shall be in writing, signed by the forester, and said approval may be revoked by the state forester in the same manner.

SECT. 2. It shall be the duty of the state forester to examine all portable steam mills or cause them to be examined, whenever he deems it necessary, to determine whether they are provided with suitable spark arresters, and whether the same are kept in constant use, as provided for in section 1 of this act. It shall be the duty of the town forest fire warden to examine portable steam mills, when requested to do so by the state forester, and make reports on the same in such form as the state forester may require.

SECT. 3. Any person operating a portable steam mill when the ground is not covered with snow, without a suitable spark arrester and the approval of the state forester, as herein provided, and any owner or part owner of said mill knowingly permitting its operation, shall be fined not less than fifty dollars and not more than one hundred dollars.

SECT. 4. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

### LIABILITY OF RAILROADS.

(Public Statutes, Chapter 159.)

SECT. 29. The proprietors of every railroad shall be liable for all damages to any person or property by fire or steam from any locomotive or engine upon their road.

SECT. 30. Such proprietors shall have an insurable interest in all property situate upon the line of their road, which is exposed to such damage, and they may effect insurance thereon for their own benefit.

SECT. 31. Such proprietors shall be entitled to the benefit of any insurance effected upon such property by the owner thereof, less the cost of premium and expense of recovery. The insurance shall be deducted from the damages if recovered before the damages are assessed, or, if not, the policy shall be assigned to the proprietors, who may maintain an action thereon.

### AN ACT CONFERRING SPECIAL AUTHORITY UPON THE GOVERNOR AND COUNCIL TO CLOSE THE OPEN SHOOTING SEASON DURING PERIODS OF PROTRACTED DROUTH.

(Chapter 59, Laws of 1909.)

SECTION 1. The Governor and Council when, in their opinion, the discharge of firearms might endanger property



by starting fires in the woodlands during a period of excessive dryness, may suspend by official proclamation, posted and promulgated through the newspapers of the state, the open season, so called, for such time as they may designate.

SECT. 2. For the period which such proclamation shall cover, all provisions of the law relating to the closed season shall be construed to be in force, and if, during the continuance of such period, any person shall shoot an animal or bird for which there is no close season otherwise provided by law, he shall be punished by a fine of fifty dollars and costs.

SECT. 3. This act shall take effect upon its passage.

AN ACT TO PROVIDE FOR THE ACQUISITION  
BY THE STATE OF THE CRAWFORD NOTCH,  
SO CALLED, IN HART'S LOCATION AND CON-  
TIGUOUS TERRITORY, AS A FOREST RESER-  
VATION AND STATE PARK.

(Laws of 1911.)

SECTION 1. The Governor, with the advice of the Council, is hereby empowered to acquire on behalf of the state, by purchase, if in their judgment it can be purchased at a fair valuation from the owners thereof, such lands lying in Hart's Location and the towns and unincorporated places immediately adjacent thereto and the wood and timber standing thereon and constituting or being a part of the Crawford Notch, so called, as said Governor and Council, aided by the advice of the Forestry Commission, may deem necessary for the preservation of the forests in said notch, and to accept deeds thereof in the name of the state, the aggregate purchase price of such lands, wood and timber not to exceed the maximum amount appropriated by this act.

SECT. 2. In case the owner or owners of any land, wood and timber deemed necessary by the Governor and

Council for the purpose aforesaid decline to sell the same for a price deemed reasonable by the Governor and Council, said Governor and Council are hereby empowered to take and appropriate the same for the use of the state by causing a survey or location of such land, wood and timber to be prepared under their direction and filed with the secretary of state, and by applying to the supreme court to appoint a commission of three members to assess the damages to the owner or owners. Upon such filing and application, the title to such land, wood and timber shall vest in the state. Said commissioners, upon reasonable notice to all parties interested and a hearing thereon, shall assess and award damages to the owner or owners of such land, wood and timber and file their assessment and award in writing with the secretary of state within ten days after the same is completed. Such owner or owners, or the state, if dissatisfied with said award, may appeal therefrom to the superior court for the county wherein the land, wood and timber is situate, and shall be entitled to an assessment of said damages by a jury on such appeal, by filing in the office of the clerk of said court a petition for that purpose within thirty days after the filing of said award with the secretary of state as aforesaid: such appeal to be prosecuted or defended by the attorney-general under the advice of the Governor and Council.

SECT. 3. For the purpose of carrying out the provisions of this act such a sum as may be necessary, not to exceed one hundred thousand dollars (\$100,000), is hereby appropriated and shall be provided in the manner following: The state treasurer, under the direction of the Governor and Council, shall issue scrip or certificates of indebtedness to such amounts as may be necessary to pay for the lands, wood and timber purchased or condemned as aforesaid, not exceeding in the aggregate the amount aforesaid. Such scrip or certificates shall be issued as registered bonds with interest coupons attached, and shall bear interest at a rate not exceeding three and one half per cent per annum; they

shall be designated on the face thereof, Crawford Notch Bonds, and shall be deemed a pledge of the faith and credit of the state, and the principal and interest thereof shall be paid at the time specified therein in gold coin of the United States or its equivalent. Such scrip or certificates shall be sold or disposed of at public auction or in such other manner, at such prices, in such amounts and at such rates of interest, not exceeding the rate above specified, as the state treasurer shall deem advisable, and shall be issued in such denominations, each certificate being for not less than one hundred dollars (\$100) nor more than one thousand dollars (\$1,000) as he shall deem advisable. They shall be made payable at such time or times, not exceeding in the case of any certificate twenty years from the date of its issue, as the state treasurer may deem advisable or the Governor and Council may direct, and at the expiration of the time so fixed interest thereon shall cease.

SECT. 4. All lands acquired under the provisions of this act shall be held by the state for the purposes of a forest reservation and state park, and the care and management thereof shall be vested in the Forestry Commission. Such land shall at all times be open to the public, under such rules and regulations as the Forestry Commission, with the approval of the Governor and Council, may prescribe. Said commission shall cause or permit no live timber to be removed from such lands without the approval of the Governor and Council, except for the purpose of improving the forest growth thereon; but timber not needed for forest conservation, or for the preservation of the scenic beauty of said notch, may be sold therefrom with the approval of the Governor and Council, and the proceeds of all such sales shall be paid into the state treasury by said commission and shall constitute a special fund, to be applied solely towards the payment of the interest and principal of the scrip or certificates issued under the preceding section, so far as needed for that purpose.

SECT. 5. This act shall take effect upon its passage.

Approved April 12, 1911.

## PROTECTION AND PRESERVATION OF ORNAMENTAL AND SHADE TREES IN THE HIGHWAYS.

(Chapter 98, Laws of 1903, as amended.)

SECTION 1. Mayors of cities and selectmen of towns shall, immediately upon the passage of this act, and annually thereafter, appoint one or more tree wardens, who shall be discreet persons, resident of the city or town where appointed, interested in planting, pruning and preservation of shade and ornamental trees in public ways and grounds, whose business it shall be to perform the duties hereinafter specified, and shall be allowed such compensation for their services and expenses as the mayor or selectmen may deem reasonable.

SECT. 2. Towns and cities shall have control of all shade and ornamental trees situated in any public way or ground within their limits, which the tree warden deems reasonably necessary for the purpose of shade and ornamentation; and it shall be the duty of the tree wardens, as soon as possible after their appointments, to carefully examine the trees, situated as aforesaid, and to plainly mark such trees as they think should be controlled by their municipality, for the purposes aforesaid. Galvanized iron disks shall be furnished by the secretary of the Forestry Commission to said officers as may be required by them for the purposes of this act at a cost not to exceed five hundred dollars a year. Said disks shall be painted red and have stamped on them the letters "N H," not less than an inch in height, and to be pierced in the center for the admission of a spike. The disks shall be inserted in each tree at a point not less than three feet nor more than six feet from the ground on the side toward the highway, by driving a spike through the disk into the tree within two inches of the spike's head, so that the disk may slide with the growth of the tree. If any of the spikes or disks shall be destroyed

or defaced it shall be the duty of the warden to renew them as soon as possible after he is informed or discovers that they have been removed. They shall also have the power to designate from time to time, in the same manner as hereinbefore directed, such other trees within the limits of the public ways and grounds as in his (their) judgment should be preserved for ornament or shade.

SECT. 3. If any of the trees designated as aforesaid should prove to be private property, and the owners thereof refuse to release or convey their interest therein to the municipality, the tree warden shall acquire them for the use of the city or town by purchase if it can be done at a fair price. Failing in this, he may take said trees for the use of the city or town by appraising the fair value of the same and by causing to be served upon the owner thereof a notice of such taking, which notice shall state the number of each variety of tree so taken, the location of the same as near as practicable, and the value thereof as fixed by him; and also by filing a copy of such notice as attested by him with the city or town clerk. If the owner shall be satisfied with the value stated in such notice, the tree warden shall cause the same to be paid to him forthwith. If the owner shall be dissatisfied with the action of said tree warden in valuing the trees so taken, he may, within thirty days after said notice has been served upon him, but not afterwards, apply to the selectmen to assess his damages. Such proceedings shall thereupon be had, including the right of appeal, as are provided in the case of assessment of damages in laying out highways by the selectmen; and thereupon such damages, if any, may be awarded as shall be legally and justly due to the landowner. Cities and towns are hereby authorized to raise and appropriate money to carry into effect the provisions of this act.

SECT. 4. Towns and cities may annually appropriate money, not exceeding in the aggregate fifty cents for each of their ratable polls in the preceding year, to be used by the tree warden in planting, pruning, protecting, and, when-

ever necessary, acquiring, shade and ornamental trees within the limits of their public ways and grounds.

SECT. 5. Whoever desires the cutting and removal in whole, or in part, of any public shade or ornamental tree, may apply to the tree warden, who shall give a public hearing upon the application at some suitable time and place, after duly publishing and posting notices of the hearing in two or more public places in town, and also upon the tree or trees which it is desired to cut and remove; *provided, however,* that the tree warden may, if he deems it expedient, grant permission for such cutting or removal without a hearing if the tree or trees in question is on a public way outside of the residential part of the town limits, such residential part to be determined by the tree warden. No tree within such residential limit shall be cut by the tree warden, except to trim it, or removed by him, without a hearing as aforesaid. The decision of the tree warden shall be final.

SECT. 6. It shall be unlawful to cut, destroy, injure, deface, or break any public shade or ornamental tree, or to affix to any such tree a playbill, picture, announcement, notice, advertisement, or other device or thing, whether in writing or otherwise, or to paint or mark such tree, except for the purpose of protecting it, and under a written permit from the tree warden, or to negligently or carelessly suffer any horse or other beast, driven or being lawfully in a public way or place, to break down, injure, or destroy a shade or ornamental tree within the limits of said public way or place; or to negligently or wilfully, by any other means, break down or injure any such tree.

SECT. 7. Owners of land abutting on the highways, and all other persons, are hereby prohibited from burning brush within or beside highways without first removing the brush such distance from the trees within the highway as not to endanger or injure them in any manner.

SECT. 8. Persons violating any of the provisions of this act shall forfeit not less than five nor more than one hun-

dred dollars, to be recovered in an action of debt by the tree warden or any other person for the benefit of the town or city in which the tree is situated, or be fined not less than five nor more than one hundred dollars.

SECT. 9. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

### TAX ABATEMENT AND PURCHASE OF SEED-LINGS.

(Chapter 124, Laws of 1903.)

SECTION 1. In consideration of the public benefit to be derived from the planting and cultivation of timber or forest trees, the owners of any and all land which shall be planted with timber or forest trees, not less than twelve hundred to the acre, shall be entitled, from and after the first day of April, 1903, to a rebate of the taxes assessed upon said land as follows: For the first ten years after the land has been so planted, a rebate of ninety per cent of all the taxes assessed upon said land; for the second period of ten years after such planting, a rebate of eighty per cent of all taxes, and for the third and final period of rebate after such planting, a rebate of fifty per cent of all said taxes; said rebate to be allowed only on condition that said planted trees are kept in a sound condition. A return of such planting shall be made to the selectmen when taking the annual inventory, which return shall be verified by the selectmen and made the basis of such tax exemption. After said trees have been planted ten years it shall be lawful for the owners to thin out the same so that not less than six hundred trees shall be left to the acre; but no portion of said planted land shall be absolutely cleared of trees during the period for which said rebate may be allowed.

SECT. 3. (2). In order to facilitate the planting of trees, as hereinbefore provided, the Forestry Commission is hereby authorized and directed to contract, without ex-

pense to the state, upon terms to be approved by the Governor and Council, with reputable nurserymen to provide, at a price to be determined upon, seeds or seedlings of timber or forest trees to landowners for planting within this state in accordance with the terms of section 1 of this act.



## LIST OF FOREST FIRE WARDENS AND DEPUTIES.

(An asterisk means forest fire warden.)

TOWN.	NAME.	TELEPHONE.
BELKNAP COUNTY.		
Alton .....	George W. Place*	
	Oscar Duncan	2-21
	Arthur D. Rollins, W. Alton	
Barnstead .....	E. B. Drake*	
	L. J. Ayers, Gilmanton I. W.	
	F. J. Holmes, Center Barnstead, R. F. D.	
Belmont .....	C. O. Judkins*	
Center Harbor..	James R. Lovett,* Meredith	
Gilford .....	A. H. Bacon*	569-11
	Frank Grant, Lakeport, R. F. D. No. 5.	562-8
	Fred J. Potter, Laconia, R. F. D. No. 4.	573-14
Gilmanton .....	Albert W. Hill,* Pittsfield, R. F. D. No. 4.	
	O. W. Price, Gilmant'n I. W.	
	Bert A. Maxfield	13-3
Laconia .....	Arthur W. Spring*	432-4
	Caleb J. Avery, The Weirs	City 123-4
	Charles P. Paquette, 11 Highland St.	N. E. 472-3
	Wilder F. Porter, Lakeport	Citiz'ns 120-4
Meredith .....	John H. Morrison*	
	A. R. Conner, Meredith Ctr.	N. E. 19-14
New Hampton..	Charles D. Thyng*	
	Victor L. Huckins, Ashland, R. F. D.	Citiz'ns 10-11
	Thomas J. Hayes, Winona	Citizens 12-2
Sanbornton .....	F. H. Hunkins,* Laconia, R. F. D. No. 1	
	Edwin W. Lane, Hill	Citizens 78-2
	Charles H. Odell, Laconia, R. F. D. No. 1	
	F. J. Thomas, Tilton, R. F. D.	Cit'ns 130-21
	J. M. Hunt, Tilton	Cit'ns 120-13

TOWN.	NAME.	TELEPHONE.
Tilton .....	Arthur Staples* John M. Hunt	Cit'ns 120-13
CARROLL COUNTY.		
Albany .....	Frank Piper,* Pequaket W. S. Schoppe, Passacona- way. Frank Harriman, Passacona- way.	Madison 4-2 15-12 Conw'y
Bartlett .....	F. J. Ward*	No. Conway
Brookfield .....	Horace E. Bean, Kearsarge Chas. Willey,* Sanbornville Wallace F. Lang, Sanborn- ville, R. F. D. No. 1	
Chatham .....	F. J. Woodus, Sanbornville A. B. Stiles,* So. Chatham P. Chandler, No. Chatham Daniel Dinsmore, Intervale, R. F. D.	
Conway .....	Fred T. Hale* J. H. Woodward, Fryeburg, Me. M. A. Heath, Greenhill Chester Potter, No. Conway H. S. Mason, Conway Ctr. E. C. Seavey, No. Conway H. E. Potter, Ctr. Conway	11-2 F'ms. L. 11-23
Eaton .....	Fred E. Kenneson,* Snow- ville Orin N. Currier, Freedom, R. F. D. G. M. Perkins, Eaton Ctr.	9021-2
Effingham .....	Richard Dearborn* Oscar Avery, Mountain View, R. F. D. No. 1 Eugene Tewksbury, Effing- ham Falls John L. Marston, Mountain View, R. F. D. No. 1	
Freedom .....	John E. Perkins,* Mountain- view H. J. Pascoe, West Ossipee G. F. Huckins L. G. Burnham	12-31
Hart's Location.	C. H. Morey,* Bemis H. T. Hartshorn, Bemis	9602-4
Jackson .....	Jonathan Meserve* David G. Dolloff D. W. Davis, Intervale	

TOWN.	NAME.	TELEPHONE.
Jackson.....	W. S. Wentworth, Intervale O. W. Hayes	
Madison .....	Thomas Croley, Glen Jos. E. Burke,* Silver Lake	
Moultonborough.	H. E. Chick Ernest Davis*	3--14 8--31
Ossipee .....	George A. Blanchard Lynde E. Davis, Ctr. Harbor F. E. Palmer,* Moultonville W. H. Lord, Mountainview Oscar Avery, Mountainview and Stevens Corner, Me., R. F. D. No. 1 Charles Eastman Albert O. Huckins, Mountainview	15--12
Sandwich .....	A. P. Fellows,* No. Sandwich L. P. Martin	
Tamworth .....	A. E. Wiggin* Thomas Boyd, So. Tamworth. Edmund Hammond S. H. Gilman, Chocorua	
Tuftonboro .....	E. B. Edgerly,* Mirror Lake	
Wakefield .....	F. B. Sibley,* Sanbornville R. B. Buzzell, Horns Mills I. L. Lord, Union N. O. Weeks	6--22
Wolfeboro .....	Ralph F. Horne*	
CHESHIRE COUNTY.		
Alstead .....	C. J. Newell*	7--13
Chesterfield .....	A. H. Post,* Spofford Perley A. Richardson, Brattleboro, Vt.	
Dublin .....	A. H. Childs* F. A. Adams Thomas S. Lynch C. D. Scribner J. A. Grau, Monadnock	17
Fitzwilliam .....	Frank D. Holman* George E. Fairbanks Clarence Dumond Orin B. Howe	51--3
Gilsum .....	Leon M. Osborne* Andrew J. Baker	
Harrisville .....	Bernard F. Bemis,* Chesham George G. Mason, Chesham Charles A. Gilcrest	4--13

TOWN.	NAME.	TELEPHONE.
Hinsdale .....	Fred A. Buckley*	
Jaffrey .....	L. W. Davis,* E. Jaffrey	
	William C. Royce, E. Jaffrey, R. F. D.	14-6
	P. N. Proctor, East Jaffrey, R. F. D.	11-3
Keene .....	Louis Nims*	139
	Robert E. Faulkner	158-W
Keene .....	Horace Robbins	
	Walter L. Moore	351-22
	Henry W. Nims	351-11
	Herbert A. Davis	343-11
	Rufus S. Graves	
	Aden H. Hall	
	George H. Matthews	343-11
	Thomas H. Stanley	346-5
Marlboro .....	Cyrus H. Kinsman*	6-14
	Norman N. Collins	4-4
	A. A. Wallace	
Marlow .....	W. W. Howe*	606-M
Nelson .....	W. S. Mansfield,* Munsonville	
	W. P. Tolman, Chesham	8-23 Harrisville
Richmond .....	S. A. Bullock,* Winchester, R. F. D. No. 4	2-14
	Albert B. Conway, Winchester, R. F. D. No. 3	
	Silas O. Martin, Winchester, R. F. D. No. 3	21-14 Fitzwilliam
Rindge .....	Albert L. Hale,* E. Rindge	9-22
	A. E. Taggart, W. Rindge	6-2
	H. D. Thomas, W. Rindge	6-24
	Harvey P. Hale, W. Rindge	9-13
Roxbury .....	L. W. Davis,* Keene, R. F. D. No. 2.	351-6
Stoddard .....	C. B. McClure,* Munsonville	
	John T. McCoy, South Stoddard	
Sullivan .....	T. A. Hastings*	547-6
	Frank L. Fifield, E Sullivan	547-4
	E. F. Nims	548-11
Surry .....	Hollis W. Harvey*	342-3
	Leon A. Hodgkins	
	S. H. Clement, Keene	
	Frank E. Ellis	
Swanzey .....	Benj. C. Snow,* W. Swanzey	
	Elmer J. Bullard	559-6

TOWN.	NAME.	TELEPHONE.
Swanzey.....	L. A. Newell, E. Swanzey	
Troy .....	Asa C. Dort*	562—5
	Oliver P. Whitcomb	
	Frank Despres	
Walpole .....	W. D. Knowlton*	10—12
Westmoreland...	Wilfred G. Reed,* West- moreland Depot	
Winchester ....	Maurice E. Partridge*	
	E. H. Naromore	34—12
	Alexander Pierce	
	John J. Qualters	
COOS COUNTY.		
Berlin .....	Winfred Hodgdon*	141—31
	H. U. Olson, W. Milan	
	Joseph A. Durant	
Carroll .....	John Paige,* Bretton Woods	9017—3
Clarksville .....	W. W. Young,* Beechers Falls, Vt.	64—5
	Charles Lord	
Colebrook .....	L. M. Lombard*	15—4
Columbia .....	John Gray*	22—21
Dalton .....	W. B. Aldrich*	55—2
	F. B. Tillotson, Whitefield	54—4
	J. M. Atkins, Whitefield	54—2
Dummer .....	Owen Crimmins*	9011—13
	H. S. Lockhart, West Milan	
	Fred Barrows	
Errol .....	Ira C. Beecher*	9011—12
	Dwight C. Thurston	Farmers 20
	James Bunnell	
Gorham .....	A. L. Burbank*	10—3
	Eugene Beaudett	
	Fred Keough	
Jefferson .....	L. D. Kenison*	1—13
	George Applebee, Jefferson Meadows	
	W. B. Paschal, Bennett's Landing.	9—13
	Albert J. Merrill, Whitefield	7—5
Lancaster .....	Samuel R. Amadon*	73—12
	Bion C. Morse	
Milan .....	John L. McIntire*	6—3
	H. U. Olson, W. Milan	
	L. A. Bickford	
	H. S. Lockhart	
Northumberland.	William Hayes,* Groveton	15—3
Pittsburg .....	W. N. Judd*	59—21
	Allen Farnham	

TOWN.	NAME.	TELEPHONE.
Pittsburg.....	Horace Wright	
	H. S. Lord	
Randolph .....	F. C. Wood*	16—32
	T. S. Lowe	16—2
	Fred Keough, Gorham	
	L. A. Watson	
Shelburne .....	James Simpson*	49—14
	A. A. Wilson	49—3
	H. C. McKeen	49—14
	L. C. McAllister	
	C. D. Peabody	
Stark .....	James W. Hickey*	16—4
	Albert M. Emery, Groveton	32—3
Stark .....	L. A. Jackson, Crystal	
	George E. Getchell, Crystal	
Stewartstown ...	George H. Carr*	
	William Hall, Colebrook, R.	
	F. D. No. 4	
	H. S. Little, Colebrook	37—221
Stratford .....	W. H. Kimball*	
Wentworth's L'n	J. R. Turner*	9011—11
Whitefield .....	G. M. Clement*	24—21
	Vernon E. Samson	59—6
	B. C. Goodwin	58—5
GRAFTON COUNTY.		
Alexandria .....	H. L. Phillips,* Bristol, R.	
	F. D.	11—11
	Jeffers Gray	
Ashland .....	L. G. Fifield*	9—4
	William F. Timlin	N. E. 20—4
Bath .....	William H. L. Reed*	
	H. F. Tewksbury, Woods-	
Benton .....	ville	83—12
	L. H. Parker*	4—6
	F. M. Tyler	
	W. W. Eastman	16—4 Pike
	George Fillian, E. Haverhill	7—13 Pike
	E. T. Page, Pike, R. F. D.	
	No. 2	15—4 Pike
	E. A. Mardin	
	Victor Brooks, Woodsville,	
	R. F. D.	16—3
Bethlehem .....	Thomas Trudeau,* Pierce-	
	bridge	9—5
	Frank Hartshorn, Twin Mt.	
Bridgewater ....	David T. Atwood,* Plymo'th	30—4
Bristol .....	C. M. Merrill*	
Campton .....	Clarence A. Smith	

TOWN.	NAME.	TELEPHONE.
Campton.....	E. K. Avery*	24-24
	Fred E. Pulsifer	9-23
	Lester M. Avery, Plymouth, R. F. D. No. 3	310-31
Canaan .....	O. B. Hussey, W. Campton	
	A. W. Hutchinson*	29-3
	Eugene A. Shepard, Canaan Center	
	Wallace G. Fogg, W. Canaan	
	Ralph Dodge	
	Allie Green	
Dorchester .....	George W. Rowen,* Cheever	
Dorchester .....	George N. Burnham, North Dorchester	
	Herbert H. Ashley, Cheever	
	Henry M. Merrill	
Easton .....	C. A. Young*	
Ellsworth .....	B. O. Avery*	
Enfield .....	Joseph Pillsbury*	2-11
	Norman Wilson, Lebanon	114-12
Franconia .....	A. B. Gordon	11-11
	E. B. Parker*	17-4
Grafton .....	Allen C. Ayer	
	A. F. Hoyt*	
	Frank Sargent	
	D. B. Smith	
	George S. Barnard	
Groton .....	Chas. A. Davis,* No. Groton	
Hanover .....	H. W. Barnes,* E. Lyme	
	A. D. Storrs	
	H. B. Fullington	
Haverhill .....	Leon E. Knight* Pike	
	Herbert A. Clark, Pike	
Hebron .....	Harry S. Morgan*	
	Walter R. Merrill, E. He- bron	
	Oscar Roby	
Holderness .....	R. P. Sanborn,* Plymouth, R. F. D. No. 4	200-22
	O. M. Pratt, Plymouth, R. F. D. No. 4	213-22 Ply- mouth
Landaff .....	C. M. Gale,* Lisbon, R. F. D.	42-3
	Burt J. Carleton, Lisbon	49-2
	Austin J. Hall, Woodsville, R. F. D. No. 2	
Lebanon .....	Roy W. Joslyn*	22-14
	A. R. Heath, Mascoma	54-13
Lincoln .....	George E. Henry*	
	Josiah Stevens, Johnson	
Lisbon .....	Harry A. Clark*	116-13

TOWN.	NAME.	TELEPHONE.
Littleton .....	Horace Sampson* Frank Weller Charles Gleede, So. Littleton Joseph Morse, E. Littleton G. O. Carpenter, No. Littleton Fred Foss, W. Littleton Horace Albee, Pattenville	125-2
Livermore .....	James C. Donahue*	
Lyman .....	Ai F. Parker,* Lisbon, R. F. D.	41-41
Lyme .....	Geo. A. Pushee,* Lyme Ctr. Sidney A. Converse Arthur E. Derby, Lyme Ctr. Henry S. Pushee	5-5 73-10
Monroe .....	Oscar Frazer* Hugh Nelson	7-12 Barnet, Vt.
Orange .....	Charles H. Ford* Wm. B. Eastman Russell Sanborn	8-13
Orford .....	John Peterson, Grafton Asa Sanborn* Frank G. Finney	10-110 9-210 Fairlee, Vt.
Piermont .....	Warren Chase John Stickney J. E. Chandler*	17-4
Plymouth .....	Fay S. Emery	
Rumney .....	L. D. Fogg* G. D. Kidder,* Rumney Depot	209-12
Thornton .....	H. L. Hilliard Frank L. Houston,* Campton, R. F. D.	7-21 5-24
Warren .....	L. W. Bradley, Woodstock William Lyford, Campton A. N. Batchelder* Harry A. Fifield Edmund N. Morrill	3-12 23-4
Waterville .....	John Merrill	
Wentworth .....	Joseph L. Tuttle*	
Woodstock .....	Freeman B. Ellsworth* E. E. Woodbury* J. E. Brown	14-2 25-6
	HILLSBORO' COUNTY.	
Amherst .....		
Antrim .....	W. W. Sloan*	51-2
Bedford .....	Charles D. White*	12-13



TOWN.	NAME.	TELEPHONE.
Bedford.....	George H. Hardy* Frank S. Crowell John Sargent Ira Barr	
Bennington ....	G. S. Holt* J. H. Balch, Antrim	17-11 Antrim
Brookline .....	Henry W. Wilson F. L. Willoby* George L. Dodge	16-13 49-22 Town- send, Mass.
Deering .....	O. D. Fessenden James F. Lock,* E. Deering Arthur O. Ellsworth, Deer- ing Center Edward W. Colburn, West Deering	35-2
Francestown ...	Arthur E. Holt* A. J. Miller Fred H. Epp Fred A. Pettee	19-7 29-14 New Boston
Goffstown .....	George L. Eaton,* Grasmere	14-25
Greenfield .....	Fred B. Atherton,* Lynde- boro, R. F. D. Walter R. Blanchard George Blanchard, Lynde- boro, R. F. D. Daniel Flynn	5-2 5-14
Greenville .....	Victor L. Parker* C. L. Batchelder L. E. Metcalf	11-3 13-5
Hancock .....	William W. Hayward* Charles A. Sheldon, R. F. D. Alvah M. Wood	18-2 9-2 16-4
Hillsboro .....	Dana Bruce* Albert J. Burnham Fred B. Monroe Thomas Devoy	24-4 5-12 47-13
Hollis .....	Lester J. Hayden,* Brook- line, R. F. D. R. W. Leslie, E. Pepperell George F. Hills C. F. Worcester W. N. Hayden, Nashua, R.F.D.	4-23 7-2 Hollis 11-12 7-3
Hudson .....	James E. Merrill* Philip J. Connell	
Litchfield .....	C. B. Campbell,* Hudson, R. F. D. No. 1 I. N. Center, Hudson, R. F. D.	551-7 12-3 Merri- mack

TOWN.	NAME.	TELEPHONE.
Litchfield.....	Fred McQuesten, Hudson, R. F. D. No. 1 Walter A. Crowell, Man- chester, R. F. D. No. 5	12-2 Merri- mack
Lyndeboro .....	E. K. Warren* Edward Dolliver, So. Lynde- boro, R. F. D. Chas. L. Perham, So. Lynde- boro, R. F. D.	
Manchester .....	Carl B. Thurber* Albert C. Lamper John W. Gott Albert L. Worthen John H. Hamer Harvey Stowe Charles Carom Wilbert Baldwin John A. Connelly	1026 or 94 13 1481 269 or 373 838-W 2150 1454 or 1482 8086-2 8051-4
Mason .....	Edward H. Russell* Clarence H. Reynolds James O. Reed	11-4
Merrimack .....	Bert L. Dutton,* Thornton's Ferry	3-5
Merrimack .....	Harry Greene, Thornton's Ferry Arthur Bowers, Nashua, R. F. D.	
Milford .....	W. L. Winslow* Fred A. Conrey Fred Jones Harry H. Thorpe	152-2 32-11
Mont Vernon ...	Charles Raymond* George F. Holt Herbert Edwards	33-4
Nashua .....	Charles H. Whitney*	112-5
New Boston....	George Bliss* William H. Pray Perley A. Todd James W. Dane Fred C. Brown	13-11 21-6 33-3 14-6
New Ipswich ...	A. E. Chase*	
Pelham .....	F. M. Woodbury*	
Peterboro .....	T. E. Driscoll* C. W. Abbott G. D. Willis, R. F. D. No. 4 Fred S. Gilchrist William A. Wilder H. C. Lane	38-4 126-22 122-13
Sharon .....	Alpha Wilson,* Peterboro	115-3

TOWN.	NAME.	TELEPHONE.
Temple .....	J. W. Edwards*	19-12
Weare .....	John E. Colburn F. E. Cutting,* E. Weare Orin Dow	20-31
Wilton .....	Edwin Barnard, Riverdale Frank L. Proctor*	
	Frank N. Gray	10-12
	L. W. Perham	7-15
	Stanley H. Abbot	2-2
	W. A. Burton	9-10
Windsor .....	J. R. Nelson,* Hillsboro Up- per Village Lester T. Chapman, Hills- boro Upper Village	3-4
MERRIMACK COUNTY.		
Allenstown .....	Charles V. Fisher* R. F. Kimball, Suncook George Dowst, Suncook	9-13 Chiches- ter
Andover .....	E. C. Perkins* Ara M. Lovering, East An- dover	
Boscawen .....	Eli D. Messer, Potter Place Samuel N. Allen*	
	Walter Eastman E. A. Griffin	12-11
Bow .....	Frank B. Folsom Frank D. Clough,* Concord, R. F. D. No. 3 Herbert White, Concord Harry Clough, Concord, R. F. D. 3	682-2 Con- cord 684-24 8-15 Dunbar- ton
Bradford .....	Frank Woodbury F. H. Gillingham*	
	George W. Cofran Moody Gillingham	6-4
Canterbury .....	L. T. Mason* Charles E. Morrill Frank C. Plaistridge Edwin M. Lyford	
Chichester .....	W. L. Langmaid* Abraham L. West, Concord, R. F. D. No. 7	16-4 18-11 Chi- chester
Concord .....	Frank L. Winslow David J. Adams* Levin J. Chase Geo. A. Hill, R. F. D. No. 2 William H. Gay	144-M 407-1 76-1

TOWN.	NAME.	TELEPHONE.
Concord.....	William M. Emerson	694-7
	Elbridge Emery, E. Concord	687-5
Danbury .....	Fred N. Dodge, Penacook	
	E. A. Farnum*	
	Warren A. Powers	
	Noah E. Lund	
	Wilber E. Webster	
Dunbarton .....	Ernest Murphy*	5-31
	A. L. Burnham, Goffstown	5-23 Dunbar- ton
	J. Charles Weatherbee, Con- cord, R. F. D. No. 2	2-14 Dunbar- ton
	Perley E. Warriner, Concord	4-3 Dunbar- ton
	Walter C. Walker	
Epsom .....	John W. Cox*	
	Geo. H. Haynes, Short Falls	9-4 Chiches- ter
	George Dowst, Suncook	9-13 Chiches- ter
Franklin .....	Albert Sherbourne	
Henniker .....	James Huntoon*	269-2
	H. A. Tucker	
	J. E. Marshall	
	W. C. Goss	
Henniker .....	H. A. Cummings	
Hill .....	Clyde A. Blake*	341-4
	Frank R. Woodward	345-6
Hooksett .....	Edwin A. Tyrrell*	
	Lucius B. Morrill, Manches- ter, R. F. D. No. 1	
	Orin J. Cate	
Hopkinton .....	W. H. Milton,* Contoocook	9-31
	James G. Rice, Contoocook	
	Marl D. Chase, Concord, R. F. D. No. 1	689-25 Con- cord
	George E. Patch, Concord, R. F. D. No. 1	691-24 Con- cord
	Arthur J. Boutwell, Con- cord, R. F. D.	
Loudon .....	Arthur K. Marston*	
	G. W. Rowell, Chichester	7-12
Newbury .....	Mark Muzzey*	
	Chester A. Gove, Mt. Sunapee	9-14
	Moody Gillingham, Bradford	6-4
	George J. Messer, Blodgett's Landing	
New London....	Ira S. Littlefield*	
	Roy E. Emery, Elkins	8-5
	William M. Kidder	6-3

TOWN.	NAME.	TELEPHONE.
New London....	H. C. Hoyt	10—4
Northfield .....	Arthur Staples,* Tilton	
	Byron Shaw, Franklin, R. F. D. No. 2	
	Walter B. Hill, Tilton	
Pembroke .....	Walter H. Bosworth, Tilton	81—13
	Fred M. Pettengill*	34—12
	Minot R. Fife, Concord, R. F. D. No. 14	
Pittsfield .....	John H. Jenness*	13—15
Salisbury .....	Berton F. Sanborn*	2—5
	John Shaw	
Sutton .....	H. L. Pillsbury,* No. Sutton	
Warner .....	Jesse M. Downes*	
Webster .....	Harris Goodwin,* Penacook, R. F. D. No. 16	4—21
	F. T. Colby	
	A. E. French	
	M. J. Walker	20—3
Wilmot .....	F. E. Goodhue*	
	J. C. Howlett, Wilmot Flat	
	C. T. Atwood, So. Danbury	
ROCKINGHAM COUNTY.		
Atkinson .....	John H. Smith*	
	Elmer E. Conley, Westville	596—W
Auburn .....	Fred H. Hall*	41—3 Salem
Brentwood .....	G. Russell Rowe*	6—32
Candia .....	Charles P. Robie, Manchester, R. F. D. No. 1	
	George V. Gage, E. Candia	
Chester .....	A. H. Wilcomb*	
	James W. Towle	
	William B. Underhill	2—8
	Walter P. Tenney	8004—8
	William T. Owen	8003—30
	James E. McCannon	
Danville .....	Herbert E. Colby*	
	Warren Hoyt	
Deerfield .....	Howard King,* Raymond, R. F. D.	
	Chester E. Maynard, Raymond, R. F. D. No. 1	
Derry .....	John D. Blake*	26—14
East Kingston...	D. M. Evans*	
	Leslie Webster	
Epping .....	James D. Whittemore*	5—2
Exeter .....	George H. Carter*	14—4
	G. F. Adams, 34 Auburn St.	

TOWN.	NAME.	TELEPHONE.
Exeter.....	H. L. Tuttle, 7 Garfield St.	
Fremont .....	Harry S. True*	37—J
	Walter H. Lyford, Epping	
	Alden F. Sanborn	29—12
Greenland .....	W. A. Odell*	
Hampstead .....	John S. Corson*	878—R
	Albert H. Little, Westville	1—2
Hampton .....	C. S. Toppin*	3—13
Hampton Falls..	F. Henry Fogg*	14—2
	S. C. Hawes, R. F. D. No. 1	
	William A. Janvrin	61—4 Exeter
Kensington .....	George A. Prescott*	
Kingston .....	Arthur H. Marshall*	62—5
Londonderry ...	J. E. Ray*	
	Frank E. Avery	39—5
	Nathan P. Watts	
Newcastle .....	J. O. White*	
Newfields .....	Perley R. Bean*	
	Harry G. Atwood	54—15
	William Pease	
Newington .....	Jackson M. Hoyt*	302—2
Newmarket .....	Daniel J. Brady*	27—11
	Fred A. Langley	32—12
	Arthur E. Thompson, R. F. D. No. 1	
Newton .....	A. W. Sargent*	3—3
North Hampton.	Otis S. Brown*	
Northwood .....	F. C. Giles*	
	Geo. Small, Northwood Ctr.	
Northwood .....	L. E. Swain, E. Northwood	
Nottingham .....	P. B. Batchelder*	
	L. T. Brown, So. Lee, R.F.D.	
	A. H. Cooper, E. Northwood	
	F. L. Gove, Raymond, R.F.D.	
	A. W. McDaniel, Barrington, R. F. D.	
	T. M. Rollins, Raymond, R. F. D.	
Plaistow .....	Fred P. Hill*	
	Elden C. Smart, Haverhill, Mass., R. F. D.	206—J
	Theodore Fecteau, Westville	5—13
Portsmouth .....	J. D. Randall*	338
Raymond .....	George E. McClure*	12—2
	Joseph A. Blake	27—2
Rye .....	C. D. Locke*	
Salem .....	F. N. Emerson,* Salem Ctr.	35—6
	C. J. Palmer, Jr., No. Salem	41—15
Sandown .....	J. F. Sargent,* Chester, R. F. D. No. 3	2—31

TOWN.	NAME.	TELEPHONE.
Sandown.....	George W. Dimmock, Chester, R. F. D. No. 3 Clarence I. Drowne, Chester, R. F. D. No. 3	2-32
Seabrook .....	F. W. Chase* Robert McQuillin, Hampton Falls, R. F. D. No. 9	
South Hampton.	Emery N. Eaton C. M. Evans* Edgar W. Wyman, Amesbury, Mass., R. F. D. No. 1	139-3 138-6 Amesbury, Mass. 59-14
Stratham .....	J. F. Emery*	
Windham .....	J. W. M. Worledge,* Windham Ctr. Charles O. Parker, Windham Depot Albert W. Farmer, West Windham	11-21
STRAFFORD COUNTY.		
Barrington .....	Walter Buzzell* Wm. Henry Felker, Rochester, R. F. D. No. 1	12-4 2-5
Dover .....	L. B. Haley, E. Barrington James Smith* E. B. Folsom, R. F. D. No. 3	186-R 251-4
Durham .....	John H. Wesley John H. Foster* C. W. Stone Fred Langley	59-13 Newmarket
Farmington .....	Fred P. Fletcher*	
Lee .....	G. A. Dudley* A. E. Thompson, Newmark't	
Madbury .....	W. H. Knox,* Dover, R. F. D. No. 5	259-14
Middleton .....	L. E. Tibbetts*	
Milton .....	Fred P. Jones,* Union Fred B. Roberts H. R. Jewett, Sanbornville	41-15 23-2 9-4 Milton Mills
New Durham...	Isaac L. Lord, Union William R. Webster* F. J. Lucas, So. Wolfeboro George W. Bennette	6-21 13-42
Rochester .....	Charles E. Randall* Wm. H. Otis, 13 Eastern Ave.	

TOWN.	NAME.	TELEPHONE.
Rochester.....	Lewis M. Richardson, Gonic W. E. Horne, 47 Chestnut St.	
Rollinsford .....	A. R. Tuttle, Gonic Chas. E. Lord,* Salmon Falls Lorenzo E. Baer, Dover Charles Plumer, Dover, R. F. D. No. 2	593—M 587—M 252—25
Somersworth ...	E. A. Farley*	
Strafford .....	George P. Foss* Martin S. Brock, Rochester J. H. Perkins, Ctr. Strafford Albert M. Leighton	13—14 3—13 9—7 15—6 Barrington
SULLIVAN COUNTY.		
Acworth .....	W. O. Kemp* Guy S. Neal F. J. Reed, So. Acworth	
Charlestown ....	G. L. Richardson* Arthur Streeter	15—3 33—2
Claremont .....	C. E. Sears*	175—R
Cornish .....	Jas. B. Chadbourne,* Windsor, Vt., R. F. D. No. 4 Elwin W. Quimby, Windsor, Vt., R. F. D. No. 3 Fennø B. Comings, Windsor, Vt., R. F. D. No. 4 George C. Huggins, Cornish Flat	76—11 37—11 45—12 Windsor 274—31
Croyden .....	James S. Lear F. W. Putnam*	9—21
Goshen .....	George F. Crane* Archie O. Gove, Mt. Sunapee	2—32 9—12 Sunapee
Grantham .....	Perley Walker*	
Langdon .....	George H. Royce* Edwin R. Wharton, Alstead	33—12
Langdon .....	Emery W. Henry, Alstead, R. F. D. No. 1 M. F. Bragg, Alstead	28—24 26—3
Lempster .....	F. A. Barton* E. E. Hurd A. K. Hodgman, E. Lempster	8001—2 5—2
Newport .....	George E. Lewis*	37—13
Plainfield .....	Louis E. Shipman,* Cornish	156—11
Springfield .....	Charles H. Brooks,* Canaan, R. F. D. H. C. Hoyt, New London B. D. Vanderhoof, Canaan, R. F. D. No. 3	



TOWN.	NAME.	TELEPHONE.
Sunapee .....	F. M. Sargent*	18-13
Unity .....	John W. Rowell	
	James W. Handly,* Claremont, R. F. D.	72-12
Washington ....	H. F. Wright, Newport	0-23
	J. W. Woods*	1-21
	W. E. Farnsworth	
	UNINCORPORATED PLACES. (CARROLL COUNTY.)	
Hale's Location.	Horace E. Bean,* Kearsarge	
	UNINCORPORATED PLACES. (COOS COUNTY.)	
Bean's Grant....	Glover Howland,* Crawford's	
Bean's Purchase.	Ernest Osgood, Intervale, R. F. D.	
Cambridge .....	A. E. Bennett,* Errol	
	Joseph Perrault, Milan	
Crawford's Purchase .....	P. J. Martin,* Bretton Woods	
Darmouth College Grant....	G. Miglierini, Bretton Woods	
	Herbert Fickett,* Wentworth' Location	
	Archie Travers, Wentworth's Location	
	Don A. Cameron, Wentworth's Location	
Dix's Grant... }	F. W. Noyes,* Dixville N'tch	
Dixville. .... }	Herbert Higgins, Beecher Falls, Vt.	
Erving's Grant }		
Kilkenny .....	G. E. Webster,* Lancaster	27-4
Low and Burbank's Grant }	Wm. Kennedy,* Gorham	
Millsfield .....	L. A. Watson	
Odell .....	G. O. Maxwell,* Errol	
	M. J. Hayes,* Groveton	
	Henry Downing, Groveton	
Sargent's Purchase .....	Thomas W. Croley, Glen	79-3
Success .....	C. S. Bean,* Berlin	
	H. W. Fowler, Berlin	
Webster and Hubbard ... }	Joseph Durant, Berlin	
Grants and Carlisle .... }	Horace Wright,* Pittsburg	