

MAINE STATE LEGISLATURE

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PUBLIC DOCUMENTS

OF THE

STATE OF MAINE

BEING THE

REPORTS



PUBLIC OFFICERS
DEPARTMENTS AND
INSTITUTIONS

FOR THE EIGHTEEN MONTHS

JANUARY 1, 1921-JUNE 30, 1922

STATE OF MAINE

Biennial Report
of
Land Agent
and
Forest Commissioner

SAMUEL T. DANA



1921-1922

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Maine's Forest Problem

Maine's forests are its greatest asset. To a larger extent than is generally realized its industrial, agricultural, and recreational development is influenced by and dependent on its forest resources. These resources are, however, being rapidly depleted and are deteriorating steadily in quality. To remedy this situation requires not only a clear-cut recognition of the goal toward which we are working, but an equally clear-cut recognition of the many practical difficulties involved in attaining that goal. The following statement of progress during the past two years and of recommendations for the future may be of assistance in bringing the consideration of our forest problem down to the discussion of concrete questions, and thus paving the way for further progress.

Forest Fire Protection

IMPORTANCE

Protection of the forests from fire, insects, and disease forms the very foundation of forest management. Fire protection has received particular emphasis because of its obvious necessity and because its control is apparently more practical than the control of either insects or disease. The fact that forest fires are due, in this part of the country at least, almost entirely to human agencies puts them in quite a different class from natural enemies. While an efficient fire fighting organization is an essential part of fire prevention, the elimination of human carelessness is even more essential and far more effective. If no one were ever careless with fire in the woods, there would be but few fires to fight.

In connection with plans for future fire protection work the fact should be clearly recognized that the fire danger is increasing each year. The tremendous amount of timber which has been killed by the spruce budworm, and which is now falling rapidly creates a new and dangerous fire menace. Present methods of cutting result in the removal of practically all merchantable softwood timber and the leaving of a large amount of slash, which dries out rapidly and remains a fire hazard for many years. Cut-over areas, because of their exposure to sun and wind, dry out much more than similarly located areas still covered by forest. And finally, the presence in the woods of steadily growing numbers of persons increases the danger from human carelessness. This situation means that increasingly effective methods of fire protection must be used if its present efficiency is to be increased or even maintained.

TWENTY YEAR RECORD

NUMBER OF FIRES, AREA, AND DAMAGE

Available statistics show that the forest fire record of the State for the past twenty years has been as follows:

	Forestry District			Outside Forestry District			Entire State		
	No.	Acreeage	Damage	No.	Acreeage	Damage	No.	Acreeage	Damage
1903.....	140	200,232	\$761,588	209	66,155	\$183,500	349	266,387	\$945,088
1904.....	31	6,958	12,665	.....	.....	.....	.....	.....	.....
1905.....	109	14,737	40,518	33	5,579	23,105	142	20,316	63,623
1906.....	56	7,250	19,488	11	371	1,540	67	7,621	21,028
1907.....	17	2,324	5,257	17	2,200	9,310	34	4,524	14,567
1908.....	127	98,691	361,796	111	43,439	257,020	238	142,130	618,816
1909.....	68	27,083	63,734	89	11,545	32,965	157	38,628	96,699
1910.....	17	267	935	18	581	1,906	35	848	2,841
1911.....	127	99,654	298,052	75	11,423	48,303	202	111,077	346,355
1912.....	63	16,198	57,152	36	4,042	14,096	99	20,240	71,248
1913.....	74	9,327	28,477	120	20,887	148,365	194	30,214	176,842
1914.....	105	8,311	14,467	52	7,405	14,840	157	15,716	29,307
1915.....	80	14,474	22,776	76	11,185	55,340	156	25,659	78,116
1916.....	54	8,257½	9,460	18	3,359	10,305	72	11,616½	19,765
1917.....	19	147	1,334	9	311	800	28	458	2,134
1918.....	58	3,820	7,291	21	5,118	70,600	79	8,938	77,891
1919.....	85	4,352	6,305	19	668½	2,625	104	5,020½	8,930
1920.....	118	34,558	143,752	46	5,245	42,155	164	39,803	185,907
1921.....	250	56,947	404,555	112	11,883	112,560	362	68,830	517,115
1922.....	164	19,198	106,001	52	2,190	8,775	216	21,388	114,776
Average..	88	31,639	\$118,280	59	11,241	\$54,637	150	44,179	\$189,002

In interpreting these figures, it must be remembered, (1) that the earlier records are undoubtedly less accurate and complete than the more recent ones; (2) that prior to 1909, when the Forestry District was created, the figures given for the District apply only to unorganized townships, and not to the entire area later included in the District; and (3) that since the creation of the District the records for it are more complete than for the rest of the State.

Inside of the Forestry District (about 9,000,000 acres) the average area burned each year amounts to 0.35 of one per cent, outside of the District (about 6,000,000 acres) to 0.19 of one per cent, and for the entire State to 0.29 of one per cent of the total forest area. The difference between individual years is strikingly brought out by the comparison between 1917, when only 458 acres were burned, and 1903, when 266,387 acres were burned.

SEASONS OF 1921 AND 1922

Abnormal Character of 1921

The year 1921 was one of the most dangerous from the standpoint of forest fires of any in the history of the State. The fire season opened several weeks earlier and continued several weeks later than usual, while abnormally dry weather prevailed throughout practically the entire summer. From April 28 to September 24, inclusive, there was not a single day in which a fire was not burning somewhere in the State. Under these circumstances the wonder is not that so large but that so little an area was actually burned over. For weeks at a time a conflagration might readily have occurred that would have swept a large part of the State.

Proclamations by the Governor

The situation early became so critical that on June 6, 1921, Governor Baxter issued a proclamation entitled "Forest Fire Emergency" in which he urged everyone, and particularly campers, fishermen, and woodsmen, to use the utmost precaution. He called attention to the fact that during May alone there were over 250 fires, and that the expense of bringing these fires under control equalled the amount spent for fire fighting during the entire year of 1920, itself an unusually bad year. Again on September 27, 1921, he issued a warning to hunters, in which he emphasized the fact that the opening of the hunting season found the woods unusually dry and the danger of forest fires critical, and urged hunters and all others going into the woods to cooperate with the Forest Service in doing everything possible to protect the valuable timberlands of the State.

Situation in 1922

The year 1922, while not so critical as 1921, was somewhat less favorable than the average and was more dangerous than is generally recognized. May was a particularly dry month, during which nearly as many fires occurred within the Forestry District as in May of

the previous year. If it had not been for heavy rains about the first of June the situation might readily have become as serious as in 1921. A favorable summer was followed by an unusually warm and dry spell the last of September and the first ten days of October. Woodsmen and others were in unanimous agreement that the forests generally were drier than had been the case at that time for at least twenty-five years.

Suspension of Hunting Season

The opening of the hunting season was followed so promptly by the outbreak of numerous fires that on October 4, 1922, Governor Baxter, in accordance with the authority granted him by Sections 38 and 39, Chapter 8 of the Revised Statutes, issued a proclamation suspending the open season for hunting until further notice. The proclamation also forbade anyone to enter upon the wild lands of the State carrying or having in his possession any fire arms, and forbade the shooting of any wild animal or bird for the hunting of which there is no close season otherwise provided by law. His action met with the practically universal approval of the press and of the general public, including those who were personally inconvenienced by the order.

An analysis of the fires which occurred at this time indicates that the proclamation was effective. Records for the Forestry District, for which alone accurate information is available, show that during the last four days of September and the first ten days of October there was a total of thirty-six fires. Only four of these occurred during the latter part of September before the opening of the hunting season. During the first three days of October there were sixteen fires, while on October 4, the day that the proclamation was issued, there were six, and on October 5 there were nine. Thereafter only one fire occurred, although the heavy rains which put a stop to the fire danger in those parts of the State where the danger was most serious did not come until three and in some places four days later. It is also worth noting that only three small fires occurred in Hancock and Washington Counties, where the hunting season for big game does not open until October 15, as

against thirty-three fires in Aroostook, Somerset, Piscataquis, and Penobscot Counties, where the season opens on October 1.

Comparison with Other Years

Figures for the years 1921 and 1922 for the entire State, based on fairly complete records for the Forestry District and on such data as it has been possible to secure from fire wardens in organized towns and plantations outside of the District, show the following comparison with the average for the past twenty years:

	Number of Fires	Area Burned Acres	Per cent of forest area	Damage
1921	362	68,830	0.46	\$517,115
1922	216	21,388	0.14	114,776
Average 1903-1922	150	44,179	0.29	189,002

It is encouraging to note that even in such an abnormally dangerous year as 1921, with 141 per cent more fires than usual, only 0.46 of one per cent of the total forest area was burned over, or 56 per cent more than the average; while in 1922, with 44 per cent more fires than usual, the forest area burned was only 0.14 of one per cent, or 52 per cent less than the average.

MAINE FORESTRY DISTRICT

AREA AND VALUE

The present area of the Forestry District, and its value as determined by the State Assessors in their 1920 valuation, are as follows:

	Number	Acres	Value
Private Ownership			
Unorganize townships	376	8,084,251	\$58,921,107
Towns and plantations	62	1,461,772	11,256,473
	— 438 *	9,546,023	\$70,177,580
Public Ownership			
Unorganized townships	366	359,179	\$ 520,047
Plantations	45	43,767	262,602
	— 411	402,946	782,649
Total	438	9,948,969	\$70,960,229

*Includes 14 towns, 3 plantations, and 10 unorganized townships in which there are no school lands for which the State acts as trustee.

The value given for the unorganized townships under private ownership includes \$1,946,776 worth of timber and grass on school lands, the right to cut which has been sold until the township is organized as a plantation. The value shown for the lands in unorganized townships under public ownership includes the land itself at an arbitrary valuation of \$1.00 per acre and the assessors' valuation of the timber and grass which has not been sold (\$160,868.) The value shown for publicly owned lands in plantations is based on an arbitrary valuation of \$6.00 per acre for both land and timber.

During the past two years six towns joined the Forestry District,—Marion, Trescott, and Whiting in 1921; and Deblois, Northfield, Silver Ridge, and Topsfield in 1922. Altogether thirteen towns and three plantations have joined the District since 1913, when the law was amended to make such action possible.

FIRE RECORD, 1921-1922

Number of Fires, Area, and Damage

A summary by counties of the fires within the District during the past two years is as follows:

	1921			1922		
	No.	Acres	Damage	No.	Acres	Damage
Aroostook	51	7,488	\$24,727	68	9,810	\$62,064
Franklin	15	2,127	6,140	5	8	193
Hancock	24	19,558	35,060	11	2,858	6,374
Oxford	9	17	245	1	Camp	800
Penobscot	33	3,052	8,362	10	269	4,138
Piscataquis	21	2,706	15,335	13	1,682	12,133
Somerset	26	1,131	8,575	29	3,258	17,844
Washington	71	20,868	306,112	27	1,313	3,455
Total	250	56,947	\$404,555	164	19,198	\$106,001

These figures, which are based on estimates by chief forest fire wardens, indicate that in 1921 the area burned over amounted to 0.6 of one per cent of the total forest area, and the damage done to 0.6 of one per cent of the

assessed valuation; while in 1922 the area burned and the damage done were in each case 0.2 of one per cent of the total. Great credit is due the entire field force for having kept the fire losses during the past two years as low as they did. This is particularly true for the year 1921, when every member of the force labored faithfully under the most adverse conditions to control the situation.

Size of Fires

On the basis of size, the fires may be classified as follows:

	1921 Per cent	1922 Per cent
Under $\frac{1}{4}$ acre	9	5
$\frac{1}{4}$ -10 acres	54	54
11-100 acres	17	27
Over 100 acres	20	14
Total	100	100

In 1921 fires over 10 acres in size comprised 37 per cent, and in 1922, 41 per cent of the total. The largest single fire in 1921 covered 17,852 acres, and in 1922, 3,500 acres. The latter, together with the next largest fire of 2,500 acres, came across the line from Canada. In 1921 the size of the average fire was 228 acres, and in 1922, 117 acres.

These figures show clearly that both the per cent of fires covering more than 10 acres and the size of the average fire are too high. One big fire may easily do more damage than a hundred small ones. It is therefore particularly important to reduce the number of large fires to a minimum. While this is difficult because of the inaccessibility and lack of available labor in many parts of the Forestry District, it is, with the cooperation of the general public, by no means impossible.

Causes of Fires

The causes of forest fires within the District during the past two years were as follows:

	1921	1922
	Per cent	Per cent
Brush burning	5	11
Campers	33	35
Incendiary	1	2
Lightning	13	5
Lumbering	6	7
Miscellaneous	2	6
Railroads	8	6
Unknown	32	28
	<hr/>	<hr/>
Total	100	100

Not only were campers (including hunters, fishermen, and tourists) clearly the chief cause of fires, but it is probable that many fires classified as due to unknown causes were actually due to campers. Lightning was responsible for an unusually large number of fires in 1921,—13 per cent, as against an average of 6.6 per cent for the last six years in the State as a whole. While lightning can by no means be ignored, it is a far less serious danger than in the western States where, as in Idaho, the number of fires attributed to it may average as high as 48 per cent of the total.

FINANCES

Season of 1921

Receipts and disbursements of Maine Forestry District funds during the calendar year 1921 were as follows:

<i>Receipts</i>	
Balance on hand January 1, 1921	\$ 330 05
1921 assessment.....	157,043 56
Interest on deposits.....	211 23
Cash advanced by land owners and others.....	30,002 72
Federal cooperation.....	17,508 82
Miscellaneous	4,625 70
	<hr/>
	\$209,722 08

Disbursements

Chief Wardens	\$26,388 89	
Deputy Wardens	2,897 74	
Patrolmen	25,160 89	
Lookout Stations	45,143 70	
Fire fighting	80,120 88	
Tools and supplies	16,626 68	
Administration	6,811 52	
Miscellaneous	6,569 80	
	<hr/>	\$209,720 10
Balance on hand Jan. 1, 1922		\$1 98

In addition to these disbursements, fire fighting bills to the extent of \$85,988.72 properly chargeable to the Forestry District were paid direct by various land owners because the exhaustion of the regular appropriation left the department without funds. These loans brought the total cost of the work during the year 1921 up to \$295,708.82, of which \$166,109.60, or 56 per cent, was for fire fighting. Of this latter amount \$9,218.31 consisted of bills carried over from 1920, itself a bad year.

Distribution of these expenditures by watersheds was as follows:

	Fire-fighting	All other	Total
St. John	\$20,423 06	\$40,979 07	\$61,402 13
Penobscot	24,196 17	39,303 56	63,499 73
Kennebec	10,762 04	21,628 62	32,390 66
Androscoggin	21,551 88*	10,306 19	31,858 07
St. Croix, Machias, Narraguagus and Union	89,176 45	17,381 78	106,558 23
Total	<hr/> \$166,109 60	<hr/> \$129,599 22	<hr/> \$295,708 82

*Includes \$10,872.57 for fire-fighting in the Town of Rangeley, reimbursement for which was later received from the town.

These expenditures left the District with an outstanding indebtedness of \$106,620.69. This indebtedness consisted of,—(1) cash contributions amounting to \$20,631.97 from individual timberland owners and operators; and (2) direct payment by owners and operators of fire-fighting bills amounting to \$85,988.72 and constituting a proper charge on Forestry District funds. The assistance rendered in these two ways made it possible, with comparatively little delay, to pay all fire-fighting bills. Prompt payment of such bills is essential for the effective handling of the fire protection work, particularly in the case of temporary laborers, from whom little or no assistance can otherwise be expected. Great credit is due to timberland owners and operators generally for their cooperation, both financially and in other ways, in helping the Department to meet an unusually difficult and critical situation.

Season of 1922

On January 3, 1922, the Governor and Council authorized a loan of \$55,974.30 from the State Contingent Fund, of which \$52,974.30 was for the purpose of retiring approximately one-half of the outstanding Forestry District bills and \$3,000 for current administrative expenses. The Council Order authorizing the loan provided that this amount was to be reimbursed to the Contingent Fund when the 1922 assessment was committed for collection (in April.) The balance of the deficit (\$53,646.39) was retired on May 1, 1922, out of the regular Forestry District assessment levied in April, and the loan made from the Contingent Fund in January was returned at approximately the same time.

These payments left a balance in the 1922 Forestry District assessment of approximately \$51,000 to meet normal expenditures of about \$120,000, leaving out of consideration entirely such additional expenditures as might be necessitated by fire fighting. This balance of \$51,000, together with cooperative Federal funds amounting to slightly more than \$14,000, was almost entirely absorbed by expenditures made and liabilities incurred

prior to June 30, 1922, when the Forestry District appropriation was left virtually without funds to continue the work during the remainder of the year. This situation was met by the passage on July 7, 1922, of a Council Order authorizing the Forest Commissioner to draw upon the 1923 Forestry District assessment to the extent of \$50,000. On August 22, this Order was revoked and another Order passed authorizing the Forest Commissioner to draw upon the State Contingent Fund to the extent of \$50,000 to be repaid to the Contingent Fund on or after April 1, 1923.

As a result of the deficit in the Forestry District appropriation, and at the request of the Governor, every effort was made to economize in Forestry District expenditures during the year 1922. While an attempt was made to maintain all absolutely essential activities, the permanent improvements constructed were limited to items of major importance, purchases of fire fighting and other equipment were curtailed, and highly desirable inspection work was omitted. In addition, during periods when heavy rains decreased the fire danger, a considerable part of the field force, amounting at times to as much as one-fourth of the entire force, was laid off.

I have regretted very much the necessity for making such temporary reductions in the permanent force, since I am satisfied that the policy would soon lead to a decided demoralization of the entire force. Thoroughly efficient men cannot be secured without a reasonable certainty of steady employment during the fire season; and in addition to the danger of decreasing the efficiency of the force in this way, there is also the danger that a sudden turn in the weather may find us short-handed. Much credit is due the men who have been laid off for the philosophic way in which they have recognized the situation and have accepted without complaint the personal sacrifice which the financial status of the Forestry District appropriation has necessitated.

A summary of receipts and disbursements during the calendar year 1922, is as follows:

Receipts

Balance on hand Jan. 1, 1922	\$	1	98
1922 Assessment		157,898	32
Interest on deposits		159	68
Loan from Contingent Fund (Jan.)		55,974	30
Loan from Contingent Fund (Aug.)		50,000	00
Federal cooperation, emergency		17,600	00
Federal cooperation, regular		18,141	20
Miscellaneous		4,366	24
			<hr/>
			\$304,141 72

Disbursements

Chief Wardens	\$23,737	96
Deputy Wardens	984	14
Patrolmen	19,013	52
Lookout Stations	35,647	39
Fire fighting, 1921 deficit	106,620	69
Fire fighting, 1922 bills	25,801	83
Tools and supplies	19,590	08
Administration	8,797	49
Miscellaneous	3,660	44
Repayment of (Jan.) Contingent Fund Loan	55,974	30
		<hr/>
		\$299,827 84

Balance on hand Jan. 1, 1923 \$ 4,313 88

Distribution of these expenditures by watersheds, exclusive of bills carried over from 1921, was as follows:

	Fire Fighting	All Other	Total
St. John	\$6,300.70	\$32,283.97	\$38,584.67
Penobscot	8,963.50	42,660.68	51,624.18
Kennebec	7,738.12	17,110.67	24,848.79
Androscoggin	389.38	7,731.12	8,120.50
St. Croix, Machias, Narraguagus and Union	2,410.13	11,644.58	14,054.71
	<hr/>	<hr/>	<hr/>
Total	\$25,801.83	\$111,431.02	\$137,232.85

Present Situation

As a result of forced economies, Federal cooperation, and a fairly normal fire season, the deficit of more than \$106,000 under which the Forestry District entered the year 1922 has now been reduced to \$50,000, the amount of the present loan from the State Contingent Fund. It is urgent that this deficit be retired before the beginning of the next fire season. The policy of reducing the deficit through forced economies in the administration of the District cannot be continued without seriously hampering the effectiveness of the work there. The full amount of the present appropriation is essential to handle the work efficiently. More rather than less funds are needed to furnish really adequate protection.

In my judgment the deficit should be met by making the present loan from the State Contingent Fund permanent, as is authorized by Section 66 of Chapter 8 of the Revised Statutes. I feel that it is sound public policy for the State as a whole to do its share in protecting from fire all of its 15,000,000 acres of forest land. The entire State is even more interested in the preservation of the forests in the Forestry District than are the owners themselves, by whom the entire cost of protection is now paid, and should certainly cooperate in meeting such an emergency as that of last year. Moreover, it must be remembered that more than half of the deficit caused by the 1921 emergency has already been taken care of, at a real sacrifice, out of the regular District appropriation. I believe that the balance should be retired by making permanent the present loan, and that in the case of future emergencies funds to meet the situation should be made available without delay from the State Contingent Fund.

District Tax

When the Forestry District was created in 1909 the special tax for fire protection purposes was placed at 1 1-2 mills on the dollar on all property within the District. This was raised in 1919 to 1 3-4 mills and in 1921 to 2 1-4 mills on the dollar. The latter effected an increase of slightly less than 30 per cent, which was,

however, largely absorbed by an accompanying increase of 33 1-3 per cent in the salaries of chief wardens, and of 50 per cent in the salaries of deputy wardens (including lookout watchmen and patrolmen) and fire-fighters. Practically no expansion in the activities of the District would therefore have been possible as a result of the increased tax even under normal conditions. As it was, such expansion was rendered still further out of the question by the fact that the District entered the year 1921 with unpaid fire bills amounting to \$9,218.31, and 1922 with an indebtedness of \$106,620.69.

While more funds could be used efficiently and would in the long run, in my judgment, prove to be true economy, it seems to me doubtful whether an increased assessment should be levied at this time. Losses suffered by timberland owners during the past few years as a result of the spruce bud worm, forest fires, and unfavorable market conditions, might readily make the imposition of an additional tax for fire protection purposes a real hardship. This is particularly true in view of the fact that they are now bearing the entire cost of fire protection in the District, and are receiving less assistance from the State than are the timberland owners outside of the District or in any other northeastern State.

It must also be remembered that in the last analysis the State itself is largely responsible for many of the fires within the Forestry District. The wild lands of the State have always been regarded more or less as common property so far as the right of access is concerned, and are freely used for hunting, fishing, and other forms of recreation. While this freedom on the part of the general public to enjoy the wild lands of the State is generally regarded as good policy and is for the most part approved by the land owners themselves, the fact must be recognized that it creates a very real fire danger. Invariably the more people there are in the woods, the more fires there are. Does not this situation impose at least a moral obligation on the State to assist financially in protecting the forests from a danger which it has itself created? Is it fair to make it impossible for an owner to keep people off his land and then force him to pay all of the bills for protecting his property against their carelessness?

ORGANIZATION

Stability

The organization of the Forestry District is now on a reasonably stable and fairly effective basis. It is a real handicap not to be able to keep any of the field force throughout the year, and under the circumstances we have been surprisingly fortunate in being able to retain season after season the services of so many of the chief wardens, lookout men, and patrolmen. These men increase in efficiency with each year of additional service, and the loss of an experienced man constitutes a decided setback to the effectiveness of the work. Stability of personnel is essential for the effective functioning of the protective organization.

Supervision

The greatest need in the Forestry District organization today is to bring the office of the Forest Commissioner into closer and more constant contact with the field force. It is a physical impossibility for the commissioner and deputy commissioner to keep in as close touch as is desirable with the thirty chief wardens and their subordinates in the nearly ten million acres included in the District. The annual meeting of chief wardens in Augusta every spring, at which problems of mutual interest are discussed and the work in each district reviewed in detail, is of assistance in this direction, but is not enough. The meeting held on March 30 and 31, 1922, covered a wide range of subjects of practical importance, and was of particular value because the wardens themselves participated freely in the discussions.

The present gap between the Forest Commissioner and the field force should be bridged by the addition to the Commissioner's office of four inspectors, one for each of the major watersheds in the District. These inspectors, who might be known as district chiefs, would spend practically all of their time in the field, but would act as the direct representatives of the Commissioner in coordinating and supervising the work of the district wardens. Such men should be financed by the State as a whole, which would thus, through the furnishing of much needed supervision, contribute toward protecting the bulk of its forest lands.

Wages

The wages of chief wardens are now set by law at \$4 per day, of deputy wardens at \$3 per day, and of fire fighters at 30 cents per hour. During 1921, when the latter wage was considerably more than that paid for woods work generally, there was considerable suspicion that fires were being set or encouraged by criminal or morally irresponsible persons for the purpose of providing profitable employment. The possibility of a recurrence of this situation should be avoided either by giving the Forest Commissioner full authority to set the wages for fire fighters, or by setting a reasonably high maximum instead of a flat rate as at present.

To a certain extent, although to a less degree, this also applies to the wages of chief wardens and deputy wardens. Chief wardens in particular receive very modest compensation in view of their responsibilities and of the general character and ability of the men occupying these positions. Here too it would seem reasonable to leave the matter of wage determination, which in the case of subordinate officers is more properly an executive than a legislative function, to the Forest Commissioner, who would then be able to vary the wages paid in accordance with the ability of the men employed and the general level of wages in similar occupations.

PERMANENT IMPROVEMENTS, SUPPLIES, AND EQUIPMENT

Lookout Towers

During the past two years five new lookout towers have been erected and two others ordered. Nine new panoramic maps have been put into use and sketches made for three others.

While the lookout tower system is now fairly complete, there are still some gaps which should be filled as fast as funds are available by the erection of some half a dozen new towers. The effectiveness of the lookout system in locating fires promptly has been proved repeatedly. They must, however, be supplemented by a

certain number of regular patrolmen who are now used only where there is an unusual fire danger, as along well-traveled roads and fishing streams and in cut-over areas. Patrolmen have two major duties,—to prevent fires from starting, and to put out those that do start while they are still small. Their work is largely educational and preventive, and their efficiency is measured by the absence of fires requiring additional help to extinguish them.

Camp Sites.

Special emphasis has been placed on the construction of camp sites in places frequented by the general public and approved by the land owners. Not only are travelers inclined to use such sites voluntarily, but if they are well distributed and conveniently placed, we can very properly insist on their doing so. Camp sites are thoroughly cleared of inflammable material, equipped with stone fire places, located near good spring water, and made sufficiently attractive so that travellers will be not only willing but glad to use them. In every case their character is indicated by "Camp Site" signs asking the cooperation of the public in keeping them clean and sanitary and in preventing forest fires.

Miscellaneous Needs.

Several wooden lookout towers should be replaced by steel ones, a number of new wardens' cabins should be built, several new telephone lines should be constructed and some of the present lines put in better condition, and in a few cases old roads should be swamped out to make it possible to get fire fighting crews to areas now inaccessible. The putting of the telephone system in first class shape is of the utmost importance, since without good telephone service the lookout stations are practically worthless and the chief wardens are handicapped in many other directions.

In the way of supplies and equipment a few portable gasoline pumps are particularly necessary. These have proved of value both in other States and here in Maine, and are coming to be regarded as an essential part of

any effective fire-fighting equipment. A considerable number of hand pumps, which make possible the much more efficient use of water in fire fighting, are also needed. Many districts are now inadequately equipped with mattocks, shovels, axes, and pails; and few of them have sufficient wangan to care for the crew that would be required to handle a fire of any considerable size. More fire warning signs should be posted. Additional boats and motor equipment are needed in certain districts. Seaplanes should be tried out.

Many needed improvements and purchases along these lines which should have been made during the past year have been postponed for lack of funds.

OUTSIDE OF FORESTRY DISTRICT

FIRE RECORD, 1921-1922

Number of Fires, Area, and Damage.

A summary by counties of forest fires outside of the Forestry District during the past two years, as reported by town fire wardens, is as follows:

	1921			1922		
	No.	Acres	Damage	No.	Acres	Damage
Androscoggin	6	690	\$2,500	..	...	...
Aroostook	9	1,000	20,075	6	146	\$690
Cumberland	3	65	325	5	243	520
Franklin	6	78	534	1	650	1,950
Hancock	17	1,289	27,056	2	250	600
Kennebec	3	37	550	3	125	425
Knox	1	40	50	..	...	...
Lincoln	7	296	2,470	2	8	75
Oxford	6	75	380	8	26	170
Penobscot	28	7,675	54,205	..	...	...
Piscataquis	5	361	1,490	3	203	2,070
Sagadahoc	..	...	...	..	...	...
Somerset	3	91	1,950	1	...	...
Waldo	1	25	...	..	...	...
Washington	13	73	450	5	315	1,925
York	4	88	525	16	224	350
Total	112	11,883	\$112,560	52	2,190	\$8,775

Size of Fires.

On the basis of size these fires may be classified as follows:

	1921 Per cent	1922 Per cent
Under $\frac{1}{4}$ acre	..	13
$\frac{1}{4}$ -10 acres	47	46
11-100 acres	36	31
Over 100 acres	17	10
	<hr/>	<hr/>
Total	100	100

The size of the average fire was 106 acres in 1921, and 42 acres in 1922. The largest single fire covered 2,730 acres in 1921, and 650 acres in 1922.

Causes of Fires.

Causes of fires were reported as follows:

	1921 Per cent	1922 Per cent
Brush burning	8	25
Campers	19	10
Incendiary	5	0
Lightning	3	0
Lumbering	2	2
Miscellaneous	10	11
Railroads	17	31
Unknown	36	21
	<hr/>	<hr/>
Total	100	100

As compared with causes of fires inside of the Forestry District these figures show, as would be expected, a much smaller proportion due to campers and a much larger proportion to railroads.

Reliability of Data.

Records of fires outside of the Forestry District are in all probability decidedly incomplete. While the law provides that all forest fires of more than one acre in extent shall be reported by the selectmen to the Forest

Commissioner together with information as to the area burned, damage done, cause, and other points of interest, and while forms for making such reports are supplied each year to selectmen, it is difficult to secure even reasonably complete or accurate returns. For this reason the seriousness of the fire danger outside of the Forestry District is not to be judged by available records of fires there.

STATE COOPERATION

Supervision.

There can be little question that the organized towns and plantations outside of the Forestry District now constitute the weakest part of the State's fire protective system. The work here is in the hands of the selectmen or assessors, and is poorly organized and supervised. The State cooperates in the maintenance of a few lookout towers and in the enforcement of the slash disposal laws, but has no control over fire fighting or other activities of the local authorities. State funds available for fire protection work now amount to \$5,000 a year, and no appropriation whatever was made for this purpose for the first six months of 1921.

The work would be greatly strengthened by authorizing the Forest Commissioner to exercise general supervision over forest fire protection in this part of the State. Such supervision would be exercised through district chiefs, who would supervise the work of the town officials, educate them in the best methods of fire prevention and fire fighting, assist them in the purchase of fire-fighting equipment, cooperate with them in the enforcement of the slash disposal laws, direct the operation of the lookout tower system, inspect cuttings on auxiliary State forests, and perform such other related work as time allowed. Six district chiefs could probably handle the work satisfactorily. They would spend practically all of their time in the field, and would act as the direct representatives of the Forest Commissioner in the same way as would the district chiefs already suggested for the Forestry District. No other single step would do so much to

place the fire protection work in this part of the State, where the forests are of far greater importance than is generally realized, on a more solid basis.

Appointment of Fire Wardens.

The work could also be strengthened by modifying the present method for the appointment of fire wardens. As the law now stands the selectmen or assessors, who are often not particularly qualified for or interested in the work, serve as ex-officio fire wardens and may appoint deputies. Better results would be secured by requiring the municipal officers to take positive action in appointing one chief forest fire warden and as many deputy wardens as necessary. This would centralize responsibility in a single individual, and by making it certain that the matter received careful consideration would in most cases result in the appointment of qualified men. To safeguard this, however, and to bring about closer cooperation between the State and the local authorities, all appointments of fire wardens should be subject to the approval of the Forest Commissioner. Sufficiently close touch with the local situation to make this approval effective would be secured through the district chiefs appointed to supervise the fire protection work in general

Lookout Towers.

The State should continue its present policy of maintaining the lookout tower system outside of the Forestry District. During the past two years this has been extended by the construction of four new towers, one of which overlooks considerable land in the Forestry District.

There are now seven lookout towers outside of the Forestry District. About six additional stations are needed to complete the system. Specific sites for some of these have already been selected, while further reconnaissance is necessary to determine the most advantageous sites for the others. This work should be completed during the next two years.

Forest Fire Emergencies.

The State as a whole has sufficient interest in perpetuating the forests in the southern part of the State so that it might well cooperate with the towns, not only through increased supervision and the maintenance of the lookout tower system, but by financial assistance in the case of emergencies. This might be done by providing that all fire fighting expenditures in any given year in excess of one per cent of the town's assessed valuation be paid from the State Contingent Fund. Any fire that exceeded this cost would constitute a real emergency that should fairly be met by the State. Payments from the Contingent Fund would in all probability seldom be required, but in emergencies would afford real relief, particularly for the smaller towns, which are more likely to suffer from disastrous fires and less able to stand the burden.

RESPONSIBILITY OF TOWN FIRE WARDENS

On May 10, 1921, the Supreme Court of the State rendered an important decision (120 Maine, 281) to the effect that property owners injured by negligence on the part of the selectmen, acting as ex-officio fire wardens, to take adequate measures for the control of fires of which they have knowledge, can recover damages from the town; and that knowledge of the existence of a fire on the part of one of the selectmen, and not necessarily on the part of all three, is sufficient to hold the town responsible for effective action against the fire.

PREVENTIVE AND CONTROL MEASURES

SLASH DISPOSAL

Protection of Adjacent Woodlands.

The last legislature made two changes in the slash law. (Ch. 174, P. L., 1921). The first of these provided that any one cutting any forest growth on property adjacent to woodlands owned by another within the State outside of the Maine Forestry District shall dispose of slash and debris caused by cutting in such a manner

that inflammable material shall not remain on the ground within fifty feet of such woodland. The second provided that permits must be secured from the Forestry Department (available through chief forest fire wardens and the municipal officers of towns and organized plantations) for the burning of blueberry land when such land is adjacent to any forest growth except when the ground is covered with snow.

Both of these provisions are steps in the right direction. It would seem advisable to strengthen the former by the omission of the words "owned by another" so as to provide for the protection of all forest growth adjacent to cutting areas, irrespective of its ownership. The mere fact that an owner is not sufficiently interested to protect his own property in this way should not relieve him of the necessity of doing so, since it is extremely difficult to limit forest fires to the area where they originate; and it is therefore impossible for an owner to jeopardize his own timber without thereby endangering the property of others. Moreover, from the standpoint of the State, the protection of all timberlands from fire is of prime importance regardless of who owns them.

Special Hazards.

Consideration should also be given at this time to the passage of legislation requiring the disposal of slash in areas where in the judgment of the municipal officers it constitutes a special menace. This would give the towns authority, which they apparently do not now possess, to protect themselves against slash left in dangerous proximity to camps, mills, or settlements, or in other places where the fire hazard is particularly great.

Methods of Disposal.

One weak point in the present slash law is that it provides merely for the disposal of slash "in such a manner that inflammable material shall not remain on the ground" within fifty feet of railroad rights of way, public highways, or adjacent woodlands. This makes it possible to comply with the law by pulling the slash

back the required fifty feet into a heavy windrow. This method of slash disposal, which is the one generally employed, may make the slash an even more serious fire hazard than before.

To avoid this danger the law should be amended to provide that the slash must either be burned or disposed of in such other way as the Forest Commissioner may approve. A permit for burning would of course be required as under the present law. Where burning for any reason did not appear to be feasible, or necessary, other methods, such as the removal of the larger branches contained in the tops and the piling in small piles of the remaining slash, could be approved by the Forest Commissioner on application. The important point is that the spirit of the law, which is to minimize the fire danger, should be carried out. This is not the case under the present method of pulling the slash back into windrows.

Cost and Value.

Much discussion has taken place, particularly in the southern part of the State, as to the wisdom of requiring the disposal of all slash on cutover areas. While burning is the most common method of disposal proposed, it might also with certain species and under certain conditions take the form of lopping the tops so that the branches would lie flat on the ground, or of simply piling without burning. That the universal disposal of slash after cutting would greatly reduce the fire danger can hardly be doubted. Whether it would be worth the cost is another question.

In the White Mountain National Forest, where the United States Forest Service requires the burning of all softwood slash and the lopping of all hardwood slash, it is estimated that the cost of the former amounts to \$1.50 per thousand board feet, and of the latter to \$1.00 per thousand board feet. On the basis of Census figures for 1919, which show a cut in Maine of approximately 1,122,000,000 board feet of softwoods, and 111,000,000 board feet of hardwoods, (including pulpwood in each case) the annual cost of slash disposal at this rate would

amount to \$1,794,000. In my judgment equally good results from the standpoint of fire protection could be secured much more cheaply in other ways, such, for example, as disposing of the slash only in the most dangerous places, keeping otherwise inaccessible areas open through the maintenance of passable roads and trails, and intensifying the present lookout and patrol system.

There are, however, other factors than merely fire protection involved in slash disposal. From the standpoint of reproduction slash is perhaps an even greater menace than from the standpoint of fire. Certainly the big piles or windrows of slash left after heavy cutting in either pure pine or pure spruce completely prevent new growth from springing up under them for many years. These piles frequently occupy a surprisingly large part of the cutover area, running in the case of heavy stands as high as one-third or even more of the total area. It is also probable that the slash by furnishing a breeding place for insects is likely to encourage and to intensify the severity of insect attacks. These features of the slash disposal problem are deserving of serious consideration and careful study.

It is by no means improbable that when the influence of slash on fire, reproduction, and insects is taken into consideration, the private owner who desires to continue in the business of forest production may find it financially profitable, even at the present estimated cost, to clean up his cutover areas. Moreover, it is likely that further experience will show how present costs can be reduced; and it must not be overlooked that slash disposal, by clearing the ground, also has a tendency to decrease the cost of logging. It has been proved beyond question that slash can be burned during the winter as logging proceeds without danger of destroying any considerable amount of existing young growth, or of starting a conflagration. Slash resulting from summer cuttings is more difficult to handle, and would probably have to be piled at the time and burned later.

CONTROL OF CAMPERS

Responsibility.

Taking the State as a whole, figures compiled by the U. S. Forest Service show that for the six year period 1916-21 "campers", under which term are included fishermen, hunters, motorists, and other travelers, were the cause of 26.3 per cent of the total number of fires. In the Forestry District, which includes that part of the State most frequented by sportsmen and tourists, the situation is still worse. Here 33 per cent of the fires were attributed to campers in 1921, and 35 per cent in 1922. To these should doubtless be added a considerable number of fires classified for lack of information as due to unknown causes.

These figures indicate a serious situation. Maine has always been liberal in allowing both its own citizens and residents of other States free access to its wild lands. Continued abuse of this liberality can result only in curtailing or perhaps in completely abolishing the privilege. The State cannot afford to let its forests be destroyed as a result of carelessness. Already suggestions have been made in various quarters that campers be kept out of the forest entirely unless in charge of a registered guide; that all those entering the woods be required to register their names, addresses, and expected whereabouts; and that smoking in the woods, or at least in cut-over areas, be prohibited. Certainly drastic action of some sort, which will necessarily apply to the innocent as well as to the guilty, will have to be taken if the number of fires set by campers continues as high as during the past two years.

Camp Fire Permits.

I believe that the time is ripe to modify the present camp fire law so as to make it more workable. The law now provides that "Whoever kindles a fire on land not his own without consent of the owner forfeits ten dollars." Strict enforcement of this provision would virtually result in keeping people out of the woods

altogether, since in most cases it is out of the question for a traveler to tell on whose land he may be, or to secure a permit for building a camp fire thereon, particularly in the case of undivided ownerships involving a large number of individuals. So far as I am aware no action has ever been brought for violation of the present statute.

As a means of making the statute workable, I suggest that it be amended to read, "Whoever kindles a fire on land not his own without a permit from the owner or from the Forest Commissioner forfeits not less than ten and not more than fifty dollars." This would still leave owners free to issue permits to their employees and friends, while at the same time it would provide a workable means of reaching the general public. Such a law could reasonably be enforced, and would work no hardship on travelers, since arrangements would be made to have permits issued by fire wardens and perhaps other designated representatives of the Department, so that they could be procured without difficulty. They would not of course relieve those holding them from the obligation to exercise due care in the building and extinguishing of camp fires, or from the penalties now provided for failure to exercise such care. Permits issued by the Forest Commissioner should contain a clause providing for their suspension or revocation at any time.

Camp fire permits are now required by the Forest Service and by many other States, apparently with good results. I believe that they would prove equally worth while here. In addition to the moral effect, which alone would be of great value, they would make it possible to keep habitually careless persons from kindling fires by refusing them permits, and to prevent entirely the building of camp fires during particularly dangerous periods.

Close Season on Fishing.

Still more important than the inauguration of a practical permit system is the control of fishermen. The Governor should have the same authority to prohibit inland fishing during particularly dangerous periods that he now has to prohibit hunting. Taking the situation year in and year out May is nearly always the worst month for

forest fires, the greater part of which are attributed to careless campers and fishermen. At that time the ground is covered with dry leaves shed the previous fall, there is no new green vegetation to check a fire, winds are apt to be heavy, and the days are steadily growing warmer instead of colder as in the fall. All these facts add to the fire danger.

There can be little doubt that if the Governor had had authority to put a stop to inland fishing, its exercise both last year and this would have saved many acres of valuable timberland and many dollars spent in fire fighting. As long as people will be careless with fire, it is essential that provision be made for keeping out of the woods during exceptionally dangerous periods those not having real business there. The object of prohibiting hunting or fishing during such periods is not, as some apparently have thought, to prevent the discharge of fire arms or the casting of a fishing line, but rather to keep out of the woods entirely those going there for recreation only. When the forests are like tinder, the fewer persons there are in them the safer they are.

Postponement of Hunting.

While the conditions at the opening of the hunting season in the fall of 1922 were unusual, they were by no means without precedent. The worst fire which ever visited the State of Maine occurred in October, 1825. As a safeguard against the repetition of such an occurrence, or even of such a series of fires as occurred this fall, it would be desirable to postpone the opening of the hunting season for big game until at least October 15, or preferably November 1. During October the danger from fires is much greater than later, more shooting accidents occur, and game is apt not to keep well. To postpone the opening of the hunting season would not only safeguard the forests but would protect hunters, and particularly hunters from out of the State, against the inconvenience to which they were subjected this year because of the unexpected closing of the hunting season.

PORTABLE SAWMILLS

On April 7, 1921, an act (Ch. 164, P. L., 1921) was approved making it unlawful to erect a portable sawmill without first obtaining a license therefor from the Forest Commissioner, and authorizing the Forest Commissioner, or forest fire wardens in organized towns, to suspend or revoke any license for violation of the slash laws, and to suspend such license in times of drought as to any portable sawmill the operation of which would create an extra fire hazard.

Question at once arose as to whether the act applied to portable mills in operation at the time it became effective. The Attorney General ruled that it did not, but that all mills erected or moved subsequent to that date were subject to its terms. Question also arose as to what constituted a portable sawmill, as a result of which the following definition was adopted by this Department: "A portable sawmill is defined as one so constructed as to be readily movable from place to place, irrespective of how often it is so moved. In other words, it is the character of construction of the mill that determines whether it is portable, rather than the frequency with which it is actually moved." Under these two rulings licenses were paid by 162 portable mills during the fiscal year 1921-22.

All wood-burning sawmills, both portable and stationary, within an eighth of a mile of forest land, should be required to use spark arresters from April to November. While this is ordinarily done, there is apparently nothing to compel it in case the operator refuses to protect both his own and the public interest in this way.

COST OF FIRE FIGHTING

Legislation should be considered which would require anyone responsible for starting a forest fire, whether personally or through an agent or employee, to pay the cost of fire fighting, such cost to be recovered through action against the responsible party. At present there is no way in which a person who starts a fire, no matter

how clearly his guilt may be proved, can be made to pay the cost of extinguishing it. In the Forestry District the cost of fighting such fires is now met by the State out of the District appropriation, while outside of the District it is met from town funds.

There seems to be no good reason why this should not be changed so as to place the burden upon the responsible party. Such a requirement would be only fair, would have a decided tendency to reduce carelessness with fire, and would relieve a present heavy draft on both State and town funds. Where an operator has a crew working for him, it is reasonable to expect him to exercise sufficient control over that crew to prevent any of its members from starting a fire. As an assistance in this direction operators might employ fire wardens who would be commissioned by and thus supported by the authority of the State. The payment of such wardens should, however, be met by the operating concern, leaving State and town funds available for other purposes.

PENALTY FOR CARELESSNESS

Carelessness with fire in the woods in any form should be made a criminal offense. There is already a penalty for leaving camp fires unextinguished, but none whatever for carelessness with matches and smoking materials, which are probably responsible for still more fires. No action can be taken against a person starting a fire in this way except a suit for civil damages by any owner injured by the fire. Since timberland owners generally appear reluctant to bring such action, and since many persons responsible for fires would be unable to pay damages, this is not an effective deterrent. A penalty of from \$10 to \$50 for throwing away in the woods any lighted matches, burning cigarettes or cigar stubs, live fire from pipes, or any other burning substance would be more effective, and would treat such carelessness as the criminal offense which it actually is.

LAW ENFORCEMENT

During the past year a special effort has been made to enforce the existing laws relating to fire protection. For the first time convictions were secured for the burning of brush or blueberry land without a permit. Four persons were sentenced to pay a fine of \$50 and costs for violation of this law. Since the law had not previously been enforced, however, and since ignorance of its existence was generally professed, the sentences were suspended at the request of the Department.

A particular effort has been made to acquaint persons throughout the State with the law, and a still more vigorous campaign of law enforcement will be conducted next year. It is believed that sufficient publicity has now been given to the present laws, so that there is no excuse for their violation, and no reason why the penalties provided should not be strictly enforced. As a part of the campaign of education, posters containing a summary of the slash laws have been widely distributed, as have also illustrated leaflets giving information regarding slash disposal.

The enforcement of the forest fire laws should not be left entirely to the State Forest Service. Their enforcement is difficult at best and can be handled effectively only by the hearty cooperation of State and local officials and private citizens. The latter particularly should recognize the fact that violation of the fire laws is a criminal offense and should regard it as a duty to report all violations of which they have knowledge to the proper authorities. The woods can be made safe only by the cooperation of the entire public in preventing fires and in bringing offenders to justice.

FOREST FIRE INSURANCE

The possibility of securing forest fire insurance at a reasonable cost is one of the essentials to placing forest production on a thoroughly sound and businesslike basis. This is not now possible. Only one or two companies at present write such insurance, these are not admitted to do business in the State, their rates are too high to be

taken advantage of generally, and they will not insure unmerchantable timber. This situation is not due entirely to the seriousness of the fire hazard to which forests are exposed. Other reasons are that the insurance companies, misled by sensational newspaper headlines, have overestimated the extent to which forest property is now being destroyed by fire where modern fire protection systems are in effect, and that private owners have not voiced a sufficiently insistent demand for the development of this form of insurance.

It has sometimes been said that individuals and corporations are prevented from investing their money in forest production because of the long time nature of the forest crop. This is not strictly true. Capital is invested without hesitation in other long time investments yielding comparatively low rates of interest. One of the serious drawbacks to timber growing today is the danger that one's investment may be completely wiped out at any time during the fifty or more years necessary to bring the forest crop to maturity. This situation naturally encourages the utilization of existing stands of timber as quickly as possible before something can happen to them, and discourages the starting of a new crop. With insurance on stands of timber of all ages available at a reasonable cost, the situation would be entirely different.

Available statistics do not indicate that with present methods of protection the danger from fire is so great as to justify prohibitive insurance rates. This is particularly true if all of the forest properties in any given region are taken into consideration. So far the tendency has been to insure only the most hazardous risks, which has naturally tended to maintain high rates. If all forest property were included, a material reduction in rates should be possible. Both timberland owners and insurance companies would find it to their advantage to cooperate in modifying the present situation so that insurance would be available at rates that would hold out a real inducement to owners generally to protect their forest property in this way.

FEDERAL COOPERATION

Since the passage of the so-called Weeks Law in 1911 Federal cooperation with the various States in forest fire protection has been an established governmental policy. This cooperation is based on a recognition by Congress of the national interest in the timber supply of the country. Wood is one of the most essential raw materials for every industry, including farming, and for every citizen. Yet while wood is used nationally, it is produced in abundance in comparatively few States. Thus, out of the forty-eight States in the Union thirty-three import more timber than they export. These thirty-three importing States include 77 per cent of the population of the country, and produce 80 per cent of its agricultural values and 88 per cent of its manufactured products. Approximately 75 per cent of our total timber production is used outside of the State where it is cut.

These facts mean that the relatively non-timbered States are even more interested in perpetuating the forest resources of the country than are the well-timbered States. For this reason the Federal Government has definitely assumed the burden of meeting a part of the cost of forest fire protection.

During the fiscal year 1921-1922 the State of Maine received a Federal allotment of \$24,550, of which \$2,500 was to be used in the enforcement of the slash disposal laws. In addition to this regular allotment, an emergency allotment of \$17,600 was received shortly after the close of the fiscal year to assist the State in meeting the emergency caused by the abnormal fire season of 1921. It is interesting to contrast this outright contribution from the Federal Government with the failure of the State to contribute toward meeting the emergency except by a delayed loan. During the present fiscal year the regular Federal allotment to Maine is \$24,000, the maximum received by any State.

The only restrictions attached to the use of this money are that it must be spent on the watersheds of navigable streams, that at least an equal amount must be spent by the State, and that the fire protective system must

be organized to cover not only mature timber but also immature timber and cut-over lands. None of these restrictions has the slightest tendency to hamper the effective use of the money. An annual inspection of our fire protective system is also made by a representative of the Forest Service, whose attitude is constructive rather than critical, and who because of his experience in other states, is able to bring us much information and many suggestions of real value. Federal cooperation has been of the greatest value in organizing and maintaining the fire protective system, particularly outside of the Forestry District. The work here was started on Federal funds, and with the present State appropriation can be continued only by their assistance.

Forest Insects

IMPORTANCE

Forest insects should receive far more attention than **is** now the case. With our present fire protection system these undoubtedly destroy each year much more timber than fire, and themselves add greatly to the fire hazard. The destruction of which insects are capable has been forcibly driven home during the past ten years by the ravages of the spruce budworm. The best information available indicates that this and other insects following up its initial attacks have already killed at least two-fifths of the total stand of spruce and fir pulpwood in the State.

It is not easy to exaggerate what such a loss means, not only to individual owners but to all the people of the leading pulp-producing State in the Union. So great and wide-spread has been the destruction that much of the dead timber cannot be salvaged before decay has made it unmerchantable. Moreover the loss has borne particularly heavily on the smaller owners, who, unable either to sell the dead timber or to hold the land without securing current revenue from it, are being forced to sell their holdings to the larger and more strongly financed corporations. The budworm attacks have therefore tended strongly toward concentration in timber ownership.

Although the worst of the present outbreak has now apparently passed, the insect is still present in small quantities throughout practically all of the spruce region and is continually threatening the remaining green stands. This means that unless adequate preventive measures are taken, other epidemics may be expected at any time when the fir, which is the insect's favorite food plant, has reached a sufficient size to make possible again the budworm's rapid multiplication. While it is true that merchantable fir trees have for the most part been annihilated during the last outbreak, fir is more abundant

than ever in the reproduction, and there is no question but that it will form a sufficiently prominent part of the next stand to make possible a repetition of the recent outbreak. To make the situation still more serious, trees weakened but not killed by the budworm are now being attacked by bark beetles, which have increased alarmingly in numbers during the last few years.

While the recent damage by the spruce budworm affords an exceptionally striking illustration of the almost unbelievable loss that may be caused by insects, it by no means stands alone. Some forty years ago merchantable stands of larch throughout Maine were practically annihilated by the larch saw-fly. During the past year a new and imported enemy of this species, the larch case-bearer, has been found defoliating the trees and threatens to do much damage. Other insects such as bark beetles, weevils, and caterpillars are constantly exacting a heavy toll from the forests. A small snout beetle known as the Pales weevil each year destroys large quantities of white pine reproduction, and is in part at least responsible for the failure of many white pine stands to come back to white pine after cutting.

STATE ACTIVITY

During the summer of 1919, a partial investigation of the budworm situation was made by Prof. M. W. Blackman of Syracuse University, the results of which were published the same year in pamphlet form. With this exception, the State had done nothing to promote the control of forest insects until September, 1921. Since then Mr. H. B. Peirson, who was the first trained entomologist to become a member of a State Forestry Department, has been devoting his entire attention to this vitally important subject. The large number of inquiries which he has received, the frequency with which his advice has been sought, and the progress he has already been able to make in working out practical control measures, are sufficient evidence of the need for such work. Already several outbreaks which threatened to do serious damage have been stamped out by putting into effect control measures recommended.

Unfortunately the regular State appropriations were not sufficient for the purpose, and the entire cost of the work has so far been met by voluntary contributions from individuals interested in the establishment of forest entomology. Such contributions cannot be counted upon indefinitely, and were in fact made with the distinct understanding that they would be continued only until the legislature had an opportunity to provide for the continuation of the work. It is highly important that the coming legislature not only do this, but increase the effectiveness of the forest entomologist's work by removing the present handicaps of a complete lack of equipment and technical assistance. The State can make no more worth while investment than to provide for the conduct of investigations that will secure the basic information necessary to place insect control in the same class with fire protection as an essential forest activity.

White Pine Blister Rust

IMPORTANCE AND CONTROL

Tree diseases are the cause of other tremendous drains on the forest, which we are doing little to stop. Their destructive possibilities are strikingly illustrated by the chestnut blight which is practically exterminating the chestnut as a commercial species. Here in Maine, where chestnut is comparatively rare, we are more concerned with the white pine blister rust, an imported disease that has made impossible the commercial production of white pines in northern Europe. It threatens to do the same in this State, in the entire southern part of which white pine is by far the most important tree, unless prompt and energetic measures are taken to check its spread.

Fortunately this calamity can be averted at a reasonable cost simply by pulling up all currant and gooseberry bushes, both wild and cultivated, within 300 yards of white pine trees. Thorough-going investigations, corroborated by field experiments, have proved conclusively that the disease cannot go directly from one pine tree to another, but must go first to a currant or gooseberry bush and then back to the pine, so that this method of control is effective in completely stopping its spread.

PROGRESS IN 1921 AND 1922

Pine owners generally are not aware of the seriousness of the disease, do not recognize wild currants and gooseberries, and do not understand how to handle their eradication effectively. It is therefore necessary to instruct them on these points, and this can be done effectively only through personal contact. An intensive and thorough-going campaign has accordingly been inaugurated to protect the white pine stands of the State. Its cardinal principle is that the State, with such Federal and town aid as may be available, will

handle the necessary educational, scouting, and supervisory work, but that the actual eradication must be done by the private owner at his own expense. Existing legislation makes possible the effective execution of this plan to the extent to which funds are available for State supervision.

During 1921 work was conducted in seven towns in York County, and during 1922 in thirteen towns in York County, two in Cumberland County, and two in Oxford County. In 1922 all towns in which work was done were designated by the Forest Commissioner under the authority given him by Ch. 178, Public Laws of 1917, as areas within which control measures against the white pine blister rust are necessary. Within these areas it became the duty of every land owner to remove all currant and gooseberry bushes, whether wild or cultivated, within 300 yards of any white pine tree, prior to July 1, 1923. In case of the failure of any owner to destroy such plants within the time specified, the Forest Commissioner is authorized to cause them to be destroyed and to charge the actual expense to the town to be collected as a State tax. It will probably be unnecessary to use this authority at all generally, since most owners have cooperated not only voluntarily but cordially in carrying out the control measures specified.

While the work has so far been confined chiefly to York County because of the prevalence of the disease and the importance of white pine there, it has recently been extended to Oxford, Cumberland, Androscoggin, and Sagadahoc Counties. Men have been stationed in these counties to carry on educational work and to secure the cooperation of the individual towns and land-owners in taking adequate control measures next season.

In addition to the educational activities already mentioned, an illustrated leaflet descriptive of the disease and its control has been widely distributed; many talks on the subject have been given to granges and other organizations; and several exhibits have been displayed at fairs and in store windows.

FINANCES AND FEDERAL COOPERATION

The present State appropriation of \$5,000 a year is insufficient to undertake control work on anything like an adequate scale, and no funds whatever were made available for the first six months of 1921. Fortunately the Federal Government has contributed to the work each year approximately the equivalent of the State appropriation, and during the present year has offered to match all expenditures made by the State, towns, and private owners up to a maximum of \$25,000. Had it not been for this assistance practically nothing would have been accomplished outside of the conduct of a few investigations and the establishment of a few demonstration areas. Incidentally, it may be remarked that in this case, as in fire protection, Federal cooperation has been stimulating, and has not been accompanied by burdensome restrictions. During the past year Federal and State funds have been supplemented by contributions from eight towns, totaling \$1,300, and by the labor of individual owners. It is estimated that at least \$10,000 worth of labor will have been performed by private owners by the end of the present fiscal year, and that this amount will be greatly increased in the future.

All of the work must, however, be done under State leadership, which cannot be made effective without larger appropriations. It should be emphasized that these are for the purpose of meeting a real emergency, and that immediate action at this time is necessary to prevent subsequent heavy losses. If Maine is to avoid large and unnecessary loss in its pine it must act more vigorously and effectively than it has so far done.

In this connection the following comments contained in a report of October 31, 1922, by Mr. S. B. Detwiler, Forest Pathologist in charge of the work for the U. S. Department of Agriculture, are of interest:

“Maine has a more extensive body of white pine to protect than any other eastern State and yet, excepting Rhode Island, you have less money for the work than any other eastern State. The disease is well established and advancing rapidly in Maine. *****.

"It is evident that the \$5,000 per annum which you are expending on blister rust work will not go far in securing protection for an area of white pine covering more than three million acres. On the basis of acreage and crop value you should have an annual appropriation of not less than \$25,000, if you expect to keep Maine in the list of pine producing States. *****.

"In order to completely clean out ribes from any town, it is logical to expect the State to give a certain amount of assistance. *****. The Commonwealth derives more benefit and profit from the pine growth than the individual pine owner and therefore some means must be found to protect areas of good pine growth even where the owners or the town are indifferent."

Forest Management

METHODS OF CUTTING

PRESENT SITUATION

To maintain the same cut from the forests year after year, protection of the forests from fire, insects, and disease must be supplemented by other measures. Haphazard methods of cutting must be replaced by methods designed to secure the desired kind of natural reproduction, and in some cases planting must be done to secure a new stand. No one method of cutting can be prescribed as the best for all conditions. In some cases cutting to a diameter limit may be good practice, in others the leaving of seed trees, and in still others clear cutting of all merchantable material. The essential feature is that the method used should be purposely shaped to achieve the desired end.

At present comparatively little of this kind of cutting is being done, although there are a few outstanding exceptions. Several owners, for example, have consistently cut their lands to a diameter limit, left seed trees, or in other ways attempted to do their logging in such a way as to perpetuate the forest. Most cutting, however, is done with little thought for the future. The fact that if fire is kept out some kind of tree growth usually follows the stand removed is due more to chance than to design. Fortunately our forests for the most part reproduce themselves so readily that this has not led to extensive devastation. It has, however, tended to bring about a steady deterioration of the forests, both as to the amount and kind of trees represented in the new stand.

PUBLIC CONTROL

During the past few years there has been much discussion throughout the country as to the desirability

of public control of cuttings on private lands as a means of securing continuous forest production. Two schools have developed,—one advocating that such control be exercised by the Federal Government, the other that it be exercised by the individual States. Bills providing for the carrying out of these two points of view have been introduced in Congress and in various state legislatures. New Hampshire in 1921 adopted a law requiring the leaving of seed trees on cut-over white pine areas. Advocates of Federal control, however, claim that few States can be expected to take action leading to effective public control, and the general lack of State legislation in this field appears to give point to their argument.

Here in Maine the discussion seems to have centered largely on the control of portable sawmill operations. Whether the portable sawmill deserves the condemnation that has been heaped upon it in comparison with other classes of operators is perhaps open to question. It is true that the portable mill has often cut recklessly and without thought of the future. The fact that it is a wanderer without a permanent stake in the country has perhaps intensified this tendency. On the other hand, the portable mill by making possible the utilization of otherwise inaccessible stands has in many cases performed a valuable economic function. While it will probably be replaced to a considerable extent by permanent mills as forest production is put on a more stable basis, it hardly seems either wise or feasible to legislate it out of existence.

It is evident that there is a growing sentiment in favor of some sort of legislation aimed at perpetuating the forests through the prevention of destructive methods of cutting. The concrete suggestions most frequently advanced are that the cutting of all trees below a given diameter should be prohibited, or that a certain number of seed trees per acre should be left after cutting. While the universal adoption of such measures might in many cases produce better results than present methods, my own feeling is that the passage of legislation prescribing specific methods of cutting is not the most satisfactory solution of the problem. No two forests are just alike,

and the best method of treatment varies so greatly according to the character and location of the particular stand in question that it is impossible to fix on a single method that will meet all conditions.

If public control is to be exercised, I believe that it can be done more effectively by providing that all cutting shall be done in accordance with plans approved by a publicly employed or approved forester. This would insure expert supervision of all cutting operations, and at the same time would leave the individual owner free to employ his own forester if he so desired. Since all owners, however, could not afford or might not care to employ foresters of their own, it would also be necessary for the State to employ a number of foresters who could review the plans of such owners. While this method, like any other, could not be expected to secure perfect results, it would insure the application to our forest problems of the best information available, and would be sufficiently flexible to fit the most widely varying conditions.

Any control of this sort, however, should be accompanied by effective cooperation on the part of the State to make forest production a reasonably safe and profitable business. In particular the State should cooperate to a much greater extent than at present in protecting the forests from fire, insects, and disease, and in determining improved methods of forest management. The question of forest taxation should also be thoroughly investigated and any present or potential hindrances to forest production inherent in the present system removed.

PROTECTION FORESTS

One very important feature of this entire question has to do with the handling of the mountain forests. Here the results of unwise methods of cutting are likely to be particularly disastrous because of their effect on erosion and stream flow. While it is probable that comparatively little damage has so far been done in this way, this is largely because the relative inaccessibility of the mountain forests has delayed their utilization. Now that logging

operations, which for the most part involve clear cutting, are extending farther and farther back, it is becoming increasingly important that steps be taken to safeguard our water supply by perpetuating the mountain forests, which are more easily destroyed than those on fairly level lands.

The importance of safeguarding these so-called "protection forests" is universally recognized. One of the principal objects aimed at in the establishment of the National Forests in this country was the protection of the water supply. The purchase of forests in the White Mountains and in the Appalachian Mountains, which has been under way since 1911, is specifically declared by Congress to be for the purpose of regulating stream flow. European countries recognize the importance of protection forests, and have enacted special legislation to prevent their destruction. France has spent millions of dollars for the reforestation of once timbered mountain slopes denuded years ago by heavy cutting.

Maine may well take the action necessary to safeguard its mountain forests before it is too late. The acquisition of State Forests in these regions will be of help, but cannot progress rapidly enough to be thoroughly effective. It should therefore be supplemented by legislation making possible the control of cutting in privately owned protection forests. In most cases such control would probably take the form of enforcing partial cuttings, in order to prevent the removal of the entire forest cover at one time.

I would suggest the creation of a protection forest commission, which would be authorized to fix the boundaries of protection forests in the State and to prescribe the methods of cutting to be used therein. Such a commission might well include representatives of the State Water Power Commission, the State Forest Service, the private timberland and water power interests, and the general public. A body thus constituted could be relied upon to take action that would be both reasonable and effective. While most owners would in all probability be willing of their own accord to regulate cuttings in mountain forests, State action is necessary in order to secure some degree of uniformity and to control those who would not.

FOREST PLANTING

Somewhat over 5,000 acres have so far been planted in the State, and private owners are constantly becoming more interested in the subject. As a means of encouraging reforestation and of assuring purchasers of good stock at reasonable prices, the State maintains a small forest tree nursery from which stock is sold at cost. Since only \$1,000 a year is available for this purpose, the amount produced each year is insufficient for the planting of more than 200 to 300 acres. The nursery does, however, serve a useful purpose, and being located at Orono is valuable in connection with the instruction of the students in the Department of Forestry at the University of Maine.

I believe that the State could to advantage increase the effectiveness of its present work in this direction by the establishment of two additional nurseries, one in the spruce region and one in the white pine region. A nursery with a capacity of approximately 1,000,000 plants a year could be established for about \$5,000. It would be self-supporting, since the planting stock should, as in the case of the present nursery, be sold at the cost of production. Desirable as is the establishment of such nurseries, however, I believe that it is less urgent than many of the other measures recommended in this report, particularly in view of the fact that reasonably satisfactory stock can ordinarily be secured from privately operated nurseries.

SUSTAINED YIELD

In addition to their protection from fire, insects, and disease, and the practice of improved methods of cutting, another step is necessary to keep the forests of the State continuously productive. It is useless to expect any region or locality primarily valuable because of its forest resources to continue prosperous if these are constantly over-cut. Merely to secure reproduction after cutting is not enough. Continuity of local supplies and of local industries can be assured only by organizing the forests on a sustained yield basis.

In addition to stabilizing industry the general application of this principle would bring with it many advantages

to the individual owner as well as to the community. By insuring an annual return it would do away with the compound interest charges which must be met when forest practice is started with the bare land, or even with a young growth unaccompanied by merchantable timber, and which so frequently cause all forestry to be regarded as impracticable. It would also do away with the depletion charge which now often constitutes such a heavy burden on the industry; and by yielding annual returns would materially relieve the tax situation.

The constitutionality of attempting to control the amount cut by any individual owner or operator is doubtful, even were such action regarded as desirable. It is, however, exceedingly important that progress be made in this direction, and it is to be hoped that private owners will take the matter up on their own initiative. As in so many other matters of forest management, united action by the owners generally would be far more effective than action by single individuals.

FOREST INVESTIGATIONS

As a basis for bringing about improved forest practice investigations as to the best methods of forest production are essential. If economic and other conditions were such that one could handle the forests of the State exactly as he pleased, he would nevertheless be unable to manage them with maximum efficiency for the simple reason that he would not know how. We still know far too little as to the life histories, characteristics, and requirements of our important trees; as to the best methods of cutting and slash disposal to use to secure satisfactory reproduction in our various forest types; and as to many other basic problems involved in the efficient protection and production of our forests.

Irrespective of the establishment of the proposed Federal forest experiment station, studies of improved methods of forest management should be made by the State in cooperation with private owners. No regional station can cover with sufficient thoroughness all of the problems by which each State is confronted, so that

studies of local problems and of the specific application of general principles will always be necessary. Such studies can be made to best advantage under the leadership of the State, but in cooperation with private owners, whose assistance both in conducting the studies and in applying the results is essential.

One of the most vital problems to be solved has to do with the large areas of hardwoods found in northern Maine. These comprise a large part of the total stand, but have so far for the most part been regarded as unmerchantable because of the difficulty of transporting them to the point of utilization. While there is no reason to doubt that these hardwoods will in time be fully utilized, it is important that this time be hastened as much as possible. In the first place, much of the timber is already mature or over-mature, and if not utilized promptly will deteriorate steadily in value. In the second place, present methods of cutting, by removing practically all of the softwood and leaving practically all of the hardwood, are inevitably resulting in an increase in the amount of the latter at the expense of the former. It is important that a thorough study of the problem be made with a view to securing utilization of the hardwoods and the maintenance of as much spruce as possible in the new stands following cutting.

Another important problem involves the study of growth, which is the very basis of any working plan aimed at securing a sustained yield. Suggestions for work in this direction have been made by Mr. Austin Cary, of the U. S. Forest Service, who during the past summer spent several months on this subject. Practical studies are much needed as to the best methods of slash disposal in different forest types, and as to the cost and value of such work. These studies should be made in cooperation with private owners and under actual operating conditions.

There are undoubtedly many opportunities for improvement in present methods of forest and wood utilization. Investigations pointing the way to new processes and improved methods are being conducted by the Forest Products Laboratory of the Forest Service at Madison, Wisconsin. We should be more closely in touch than

at present with these investigations, which cover such fields as pulp and paper making, kiln drying, wood distillation, the efficient utilization of dimension stock and other lumber, and in general the physical, mechanical, and chemical properties of wood. It would be to our advantage to have at least one thoroughly trained man who could bring the results of investigations by the Laboratory to the attention of our wood-using industries and assist in securing their practical application, and who on the other hand would keep the Laboratory in touch with our particular problems needing further investigation.

EXTENSION WORK

Extension work in connection with the handling of farm woodlots constitutes another field deserving immediate attention. With farm woodlots occupying nearly 25 per cent more area than the improved land on farms and yielding a product third in value among all farm crops, there can be no question as to the desirability of adopting measures leading to their improved management. Assistance to farmers in the handling of their woodlots should be extended to them through the Extension Service of the University of Maine, working with and through the county agent system, and in cooperation with this Department. The value of extension work has been so thoroughly demonstrated in other fields that there can be no doubt that it would be equally worth while in forestry. The addition of a forest extension specialist to the present staff of the University is a much needed first step and would prove most helpful in improving the present handling of our farm woodlots.

Public Instruction in Forestry

UNIVERSITY OF MAINE

Particular attention is called to the valuable work being done by the Department of Forestry at the University of Maine. This Department is now completing its twentieth year of creditable service, has a steadily increasing enrollment which now amounts to nearly one hundred, and is one of the largest departments in the College of Agriculture.

It is of prime importance that adequate instruction in forestry be given in a State whose forests constitute its chief natural resource and occupy a greater area than those of all the rest of New England put together. The present forestry staff of one professor and one assistant professor is insufficient to handle efficiently the work of the Department, which is still further handicapped by a lack of technical equipment and clerical assistance. All of these handicaps should be removed at the earliest possible moment and the Department put on a basis to function effectively. The present appropriation is insufficient to maintain the Department even in its crippled condition, and has had to be augmented during both of the past two fiscal years by contributions from the State Contingent Fund.

It has been suggested that the Department of Forestry, which from the beginning has been a part of the State Forest Service, should be transferred to the University of Maine. While the proposed transfer may be all right in theory, and perhaps in time advisable in practice, I do not believe that the time has yet arrived when the change should be made. Such action should not be taken until the University is in a position to finance the Department and to place it on a stable and permanent basis. To modify the present situation until that time arrives would be unfortunate and likely to hamper, if not to destroy, the effectiveness of the Depart-

ment's work. Eventually it may well be that a distinct College of Forestry should be established at the University.

EXHIBITS

In both 1921 and 1922 a forestry exhibit was displayed at the Eastern States Exposition at Springfield, Mass. That of 1921 featured particularly forest fire protection, while that of 1922 emphasized Maine's woods and wood products. Although these exhibits reach large numbers of people, they are now so completely surrounded by commercial displays as to greatly decrease their effectiveness and to give a wrong impression as to their character and purpose. I therefore question whether their continuance is worth while unless the State should decide to erect a special building on the Exposition grounds in which exhibits relating to all its activities could be housed.

Greater activity in connection with the various State fairs and other local exhibitions would be well worth while. These would reach many people who could not be reached in any other way, and would be effective in disseminating information regarding the forest resources of the State and the activities of the State Forest Service.

FOREST GUIDES

Another interesting development in connection with the Boy Scout movement is the organization of the "Forest Guides." These include boys who have a particular interest in forestry, and who desire to participate in promoting its practice. To be eligible for appointment as a Forest Guide a boy must have qualified as a first class scout; must have a thorough knowledge of the correct use of the knife, hatchet, and compass, and of map reading; must know where and how to build fires, and how to extinguish and fight fires; and must be familiar with the forest fire laws of the State. In addition he must have signified his willingness, with the consent of his parents, to assist in putting out forest fires in his immediate locality when called upon to do so by proper authorities.

At the outset the plan is being put into effect only in the four organized councils of Boy Scouts in the State. It is believed that it will add a new, wholesome, and useful interest to the present Boy Scout activities, and will contribute in a very real way to the effectiveness of our fire protection and other forest work. As the plan is put into actual practice many new and interesting lines of work for Forest Guides will undoubtedly develop, such as distribution of fire-warning notices and fire protection literature, organization and execution of arbor day exercises, tree planting on waste lands, white pine blister rust control, special excursions to the woods, and other activities not now foreseen.

ARBOR DAY AND FOREST PROTECTION WEEK

By proclamation of the Governor May 7, 1921, and May 5, 1922, were observed as Arbor Day throughout the State. Arbor Day serves a most useful purpose in focusing public attention on the importance of trees and tree planting. This is particularly true in the public schools, where suitable exercises are now very generally held. Wide and beneficial use is made of the Arbor Day handbook entitled "Tree Planting in Maine," which was published by this Department in 1916.

Forest Protection Week was observed for the first time in 1921. In accordance with a proclamation by President Harding, Governor Baxter set aside May 22-28, 1921, for its observance here in Maine. He urged the citizens of the State "to plan for that week such educational and instructive exercises as shall bring before the people the serious and unhappy effects of the present unnecessary waste by forest fires and the need of their individual and collective efforts in conserving the forests of the State. ***** Let us remember that our forests are one of the chief bulwarks of our prosperity, and that in protecting them from fire we are contributing to the present and future welfare of the State."

In 1922 Governor Baxter requested me to arrange for the observance of May 7-13 as Forest Protection Week. A leaflet calling attention to the fire danger, presenting

some pertinent forest fire facts, and urging each and every one to do his part to protect the forests not only by being careful himself but by teaching others carefulness, was widely distributed among the schools and civic organizations throughout the State. It is believed that the observance of Forest Protection Week, originated by President Harding on a national scale two years ago, has been of real value in arousing the people to a realization of the importance of forests and forest protection, and should be continued.

PUBLICATIONS

The present appropriation for Public Instruction in Forestry is not sufficient to finance the forestry course at the University of Maine, to say nothing of providing for educational work in the schools and among the general public. As much as possible along these lines has, however, been done with funds available from other appropriations. Public attention has been called to the importance of forestry through talks before various organizations, through the publication of informative leaflets, and through newspaper and magazine articles. Special mention should be made of the following publications issued by the Department:

"Maine Forest Service,"—a four page leaflet outlining briefly the activities of the Department, and stressing particularly forest fire protection and white pine blister rust control.

"Forest Facts for Motorists,"—a four page leaflet emphasizing the importance of the forests, summarizing the forest fire laws of the State, and pointing out how to help in fire prevention. Through the courtesy of the Secretary of State copies have been distributed to all persons securing automobile or drivers' licenses. Knowledge of the facts contained in this leaflet is prescribed by the Penobscot Council of the Boy Scouts of America as one of the prerequisites for qualification as a second class scout.

An illustrated leaflet summarizing the present slash law, showing the right and wrong ways of burning brush,

and urging cooperation in slash disposal and other fire prevention measures.

Fire warning cards, distributed through the courtesy of the Commissioner of Inland Fisheries and Game to guides, hunters, fishermen, proprietors of sporting camps, and others.

Fire warning tags, to be attached to automobile steering wheels, distributed in part through the cooperation of the Boy Scouts of the State.

Much more should be done along these lines, particularly in the preparation of interestingly written and attractively illustrated publications. The popularity and effectiveness of previous publications of this sort, such as "Forest Trees of Maine," "Tree Planting in Maine," "Forest Planting in Maine," and "Forest Protection and Conservation in Maine," offer ample evidence of the possibilities in this direction. Educational efforts of this sort will unquestionably yield large returns, especially among the schools, in comparison with the expense involved.

Public Lands

AREA

The area of school and Indian lands for which the State now acts as trustee is as follows:

	No.	Acres
School Lands		
Plantations	55	53,290.66
Unorganized townships:		
Timber and grass sold	356	331,422.00
Timber and grass not sold	9*	8,608.00
	<hr/>	<hr/>
	420	393,320.66
Indian Lands		
Indian Township, Washington Co.	1	19,149.00
	<hr/>	<hr/>
Total School and Indian Lands	421	412,469.66

*In addition there are three townships in which only part of the timber and grass have been sold.

The State itself owns about 208 islands along the sea coast, the exact area of which is not known. It is also the owner of 107 acres in the Town of St. Agatha, and of 200 acres in T. 14, R. 14, W. E. L. S., which have never been sold.

That part of the White Mountain National Forest lying within the State of Maine now comprises 32,164 acres. It is planned eventually to extend the area of the Forest in the State to 121,503 acres.

RECEIPTS

Receipts from stumpage permits and camp site leases on school lands and Indian lands during the calendar years 1921 and 1922 were as follows:

	1921	1922
Stumpage		
School lands	\$29,462.55	\$5,834.06
Indian lands	3,523.58	\$ 813.69
	<u> \$32,986.13</u>	<u> \$6,647.75</u>
Camp Sites		
School lands	\$ 580.00	512.00
Indian lands	5.00	5.00
	<u> \$ 585.00</u>	<u> \$ 517.00</u>
Total	<u> \$33,571.13</u>	<u> \$ 7,164.75</u>

These receipts are added to the permanent fund of the town in question, and the interest on this fund used for school or Indian purposes, as the case may be. The marked falling off in 1922 is due to the decreased demand for stumpage resulting from current market conditions.

In addition, the following amounts, which are credited to the General Fund in the State Treasury, were received during the calendar years 1921 and 1922:

	1921	1922
Lease of islands	\$ 70.00	\$ 50.00
Interest on deposits	372.57	161.94
Office fees	57.00	41.64
Sale of Land	- - -	143.00
	<u> \$499.57</u>	<u> \$396.58</u>

Receipts from the White Mountain National Forest amounted to \$464.77 in 1921 and to \$280.58 in 1922. In accordance with Chapter 3, Public Laws of 1921, these were turned over to the treasurer of Oxford County for use on the public roads of the county.

SURVEYS AND SALES

During the past two years school lots have been surveyed in the following towns:

1921	1922
Caratunk Pl.	Bigelow Pl.
Glenwood Pl.	Codyville Pl.
Lakeville Pl.	Coplin Pl.
Moose River Pl.	T. 3 R. 2 W. E. L. S.
Silver Ridge Pl.	(Formerly Leavitt Pl.)

Locations of school lots have been made for the first time in:

1921	1922
T. 5 R. 11, W. E. L. S.	T. 4 R. 11, W. E. L. S.
T. 7 R. 12, W. E. L. S.	Carrying Place Pl. Pleasant Ridge Pl.

Two sales from the school lands in Wallgrass Plantation have been made to actual settlers in accordance with Ch. 56, Resolves of 1905,—one (P. L. 6) of 49 acres to Thomas Pinette, Jr.; the other (P. L. 13) of 33 acres to Peter St. Peter. Arrangements have also been made for the sale to Thomas Berry of 2 acres in West Forks Plantation, in accordance with Ch. 21, Resolves of 1921. It is now the established policy of the State to sell school lands only to actual settlers.

ADMINISTRATION

Under present conditions the efficient administration of either school or Indian lands is impossible. The annual appropriation of \$1,000 for "Retracing and Defining Lines" is hardly sufficient for that purpose alone, to say nothing of supervising timber sales and camp site leases and preventing trespass.

The boundary lines of some of the school lots have not been re-run for over fifty years. Adequate supervision of timber sales is out of the question, and in some cases it is not even possible to look over the area before the sale is made. A field inspection of proposed camp site leases is seldom feasible. Trespass, particularly by squatters, is common and practically unchecked.

This situation should not be allowed to continue. There is no reason why the State as trustee for these lands should not know precisely what use is being made of them and supervise such use. The school lots are not "public" lots in the sense that they are intended for the free or unregulated use of the general public. On the contrary they were reserved specifically for the purpose of providing funds for the maintenance of public schools.

This purpose should be strictly adhered to and full value secured from timber sales, camp site leases, or any other use to which they are put. Indiscriminate squatting and other forms of trespass should not be permitted. If the land is to be used the State should have full knowledge of such use and collect a reasonable rental therefor. If the land is suitable for farming and its sale for that purpose is authorized by the legislature, the sale should be made at the same price as would be secured for similar land in the same neighborhood under private ownership. Any other course would virtually deprive the schools, for the benefit of private individuals, of funds intended exclusively for their use.

The same situation exists in Indian Town in Washington County. This comprises some 18,000 acres of forest land which, if properly managed, could be made to produce indefinitely a sustained yield of spruce, fir, white pine, and other species. Placing the town under conservative forest management would not only benefit the Indians financially, but would offer an unusually good opportunity to use the forest for educational, experimental, and demonstration purposes. This would involve the preparation of a definite working plan that would do away with the present haphazard method of making timber sales by putting them on a scientific and businesslike basis.

In order to place the handling of both school and Indian lands on a sound footing the appropriation for "Retracing and Defining Lines" should be changed to "Administration of Public Lands," and increased sufficiently in amount to make possible the employment of a year-long forest engineer and of a temporary assistant during the summer months. Such a man would handle the necessary surveying, supervise sales of timber and leases of camp sites, and look out for trespass on the public lands. Proper management of these lands is essential to keep them in good condition and to make them yield continuously the revenue which they should. It is also essential to maintain the reputation of the State, the present failure of which to meet adequately its duties as trustee is the cause of considerable adverse criticism.

OWNERSHIP OF ISLANDS IN GREAT PONDS

On March 11, 1922, the Attorney General, in reply to a question as to the ownership of an apparently unclaimed and untaxed island in Jamie's Pond in the Town of Farmingdale, rendered the following opinion:

"No general rule can be given which will apply to all islands situated in the great ponds of this State but in each case the ownership of any island must be determined by the records and facts as to occupancy, etc. of that particular island. We do not think, however, that the State has such an ownership in the great ponds as to give it, from the mere fact of their location, a title to the islands in such ponds. In other words, while the people of the State have certain rights in the great ponds such as the right of fishing and fowling, those rights do not carry with them the ownership of the islands as part of the ponds. ***** The State has no title to any islands unless it has acquired the same by purchase, grant, or some other legal way. The ownership of any particular island is to be determined the same as any other piece of real estate, by records and other evidence of ownership."

State Forests

PRESENT STATUS

At present the State owns no land that can properly be classed as State Forests. Since 1919, with the exception of the first six months of 1921, there has been an annual appropriation of \$10,000 commonly referred to under the title "Purchase of Lands and General Forestry Purposes." During the years 1919 and 1920, however, this appropriation was so urgently needed for other purposes that none of it was available for the purchase of State Forests. During each of the fiscal years 1922 and 1923 the sum of \$5,000, or half of the appropriation, was reserved for such purchases, which the law provides shall be made by the Governor on the recommendation of the Land Agent and with the approval of the Council. For various reasons no purchases have yet been made, and the important question of the general policy to be pursued still remains to be determined.

PURPOSE

State Forests properly located will serve many purposes. Being conservatively managed for continuous forest production, they would serve as demonstrations of the value of such management and could also be used for experimental purposes. They would help to maintain the flow of our streams, would serve as recreation areas, would assist in stabilizing the forest and wood-using industries, and in time would be a source of no inconsiderable revenue to the State. They would also make it possible to restore to productivity waste lands not likely to be reforested by private initiative. Since many areas are suitable for the achievement of these purposes, it is important that a well-defined policy be approved by the Governor and Council which will serve as a guide in the choice of specific areas to be purchased. In general, State Forests should be located on reasonably

good growing lands and in sufficiently solid bodies to make practicable their efficient administration. At the same time smaller bodies of forest land in the more settled portions of the State may be of much value for demonstration and experimental purposes. They would also help materially to stabilize the wood-using industries and rural communities in their vicinity, both through the timber which they would themselves produce and by bringing about the practice of better forest management on neighboring private lands.

Many of the objections raised to the acquisition of State Forests are, I believe, based on a misconception of their purpose and value. As already indicated, they would be located on areas where private ownership is not apt to secure the desired results and for purposes in the accomplishment of which the State should take the leadership. State ownership of a relatively small proportion of the total area does not mean interference with the general principle of private ownership, nor does it mean the introduction of State logging on State-owned lands. Several facts should, however, be definitely recognized at the outset,—

1. If purchases are confined largely to cut-over and waste lands it will be many years before a net revenue can be derived from them.

2. The lands must be managed under forestry principles. The most valid objection to the acquisition of State Forests that I have heard is that the State does not now handle properly the lands for which it acts as trustee. Until this situation is remedied and the State evinces a purpose to improve its present practice in this respect, skepticism as to the real value of its management of State Forests may well be justified.

3. Any adequate program for the acquisition of State Forests will eventually require considerable money. This can be raised either by direct appropriations or by bonds. The latter cannot, however, be issued for this purpose under the present State Constitution. If it were not for this constitutional objection, the plan proposed by Mr. W. B. Kendall at the January, 1922, meeting of the Maine Forestry Association would be worthy of consideration.

4. Purchases of State Forests represent a capital investment and not a current expenditure. In a way they are comparable to investments for road building, with the additional advantage that the forests should in time become self-supporting through the revenue derived from timber sales.

Town Forests

More or less interest has recently been shown in the acquisition by local communities of town forests. At present the area of forest land owned by towns is small, and consists chiefly of the reserved lands set apart for school purposes when the towns were still unorganized. In most cases, however, these school lands were sold after the organization of the towns resulted in transferring their administration from the State to the towns.

Town forests are a well recognized institution in most European countries and are being regarded with increasing favor in the United States. In Massachusetts, for example, there is now a strong movement for the acquisition of town forests, which may be in part the cause of the increasing interest in the subject being manifested here in Maine.

Question having been raised as to whether towns now have authority to acquire town forests by purchase, gift, or in any other way, the matter was presented to the Attorney General, who expressed the following opinion: "It is settled law in this State that towns have the right to purchase and hold for public use any property, real or personal, and to accept any gift or devise of such property. Towns may also legally acquire and hold title to real estate through sales for taxes. We presume that any forest acquired by a town in any of the methods mentioned would be held for public purposes. An exhaustive examination of the authorities upon this subject may be found in *Libby vs. City of Portland*, 105 Me. 370."

Auxiliary State Forests

The last legislature, by the passage of Chapter 78, Public Laws of 1921, commonly known as the "Granville Bill," provided for the establishment of Auxiliary State Forests, the object of which was to encourage forest production by granting certain exemptions from taxation to those owners who would agree to handle their lands in accordance with the methods specified by the law.

So far three owners have listed a total of 10,646 acres as Auxiliary State Forests in fourteen towns in Androscoggin, Cumberland, Oxford, and York Counties. Both the total area listed and the number of owners who have taken advantage of the law are small. Furthermore it is understood that in many of the towns the assessors have ignored the fact that the land has been listed and have taxed it on the same basis as previously. It is also understood that the owner of these lands does not intend to contest this action and will probably withdraw them from listing. Under these conditions it is questionable how effective the Act will be in accomplishing its purpose of encouraging reforestation and the practice of forestry.

Forest Taxation

RELATION TO FORESTRY

For years there has been much discussion in this country as to the influence of present methods of forest taxation on the practice of forestry. Many economists, foresters, timberland owners, and others have felt strongly that to tax growing timber year after year as a part of the realty under the general property tax, as is now done in every State in the Union, has a decided tendency to force the premature cutting of timber and to discourage the reforestation of cut-over lands. In many states modifications have been adopted in the attempt to nullify the unfortunate effect of these two tendencies.

SITUATION IN MAINE

Here in Maine forest taxation has been the subject of considerable discussion, which in recent years has centered chiefly on the effect of the present method of taxation on timber growing. The Auxiliary State Forest law passed in 1921 was a direct result of this discussion. The small area that has been listed under this act, however, and the tendency of local tax officials to ignore it, raise doubt as to whether it can be regarded as a real solution of the problem. This doubt is strengthened by the fact that very little has been accomplished by similar laws in other states. It would seem that optional laws have not accomplished their purpose and that to be really effective any change in existing methods must apply to all forest lands.

During the past few years, the insistent demand for additional funds for both State and local purposes has made it necessary for assessors to look for new sources of revenue. As a result there has been a growing tendency to increase valuations on forest property. The situation in the organized towns and plantations is more serious in this respect than in the unorganized townships, which

do not pay local taxes. For this reason complaint against the present system is not common in the case of the latter, while it is becoming more and more general in the case of the former.

Figures recently compiled by a timberland owner show that for certain forest property located in twenty-five organized towns in Penobscot, Piscataquis, and Aroostook Counties, the valuation increased from \$150,636 in 1915 to \$216,559 in 1922. During the same period the average tax rate increased from \$27.50 per thousand to \$43.30 per thousand, and the tax assessed from \$4,006.37 to \$9,253.32. These figures show an increase in valuation in seven years of 44 per cent, an increase in the tax rate of 57 per cent, and an increase in the tax actually assessed of 130 per cent. Meanwhile, the owner states that 75 per cent of the merchantable timber has been cut, 6 per cent of the area burned over, and 50 per cent of the remaining spruce and fir killed by the spruce budworm.

A situation of this sort clearly holds out every inducement to the owner to clear and abandon his land at the earliest possible moment. It is equally effective in discouraging any attempt to grow a new crop of timber. No one can afford to pay taxes annually on the full value of both land and timber during the fifty or more years required to bring the forest crop to maturity. Taxation of growing timber on this basis is strictly comparable to taxing a farmer every week or oftener on his crop of corn.

PROPOSED REMEDIES

That the general property tax as applied to both land and timber is not suited to a crop that requires several decades for its production is the unanimous opinion of all of who have studied the problem. The modifications generally recommended are to impose an annual tax on the value of the bare land only and a yield tax on the value of the timber when cut. The taxation of mature timber constitutes quite a different problem from the taxation of growing timber; and there is rather general agreement that the full application of the general property tax to the former is good public policy.

While the broad outlines of an improved system of forest taxation are fairly clear, the practical working out of the many details and conflicting interests involved constitutes an exceedingly complicated problem. Among other things, it is essential that any modification proposed encourage rather than discourage timber growing, that it provide for the safeguarding of current local revenue, and that it be fair alike to the timberland owner and to the general public. The fact must be squarely faced that any system of taxation which discourages timber growing is short-sighted and will inevitably tend to deplete the very resource which both directly and indirectly through the industries that it supports now constitutes the chief asset of the State. It is poor policy to kill the goose that lays the golden egg.

Too hasty legislation, however, may be worse than no legislation at all. I therefore suggest that the legislature make provision for a thorough study of the entire problem of forest taxation either by the Forest Service of the U. S. Department of Agriculture or by a commission appointed by the Governor and including in its membership representatives of the timber, agricultural, and industrial interests of the State. Such a commission would be able to study the problem from all points of view and to present specific suggestions for such changes as seem advisable. It would be desirable to instruct the commission to submit a preliminary report for general discussion by the end of 1923, and to submit a final report, with recommendations, to the 82nd Legislature.

Legislation, if necessary, would also seem advisable requiring the assessment separately of forest land and of the timber growing on such land. Without the information that would be yielded by figures of this sort, it is difficult to see what would be the exact effect of any change in the present general property tax as applied to forest lands, or to make any thorough and intelligent study of the problem.

Registration of Surveyors and Surveyors' Marks

All land surveyors have special marks with which posts or monuments set by them are inscribed, and by which their work is identified. At present there is no way by which one not familiar with the mark of the surveyor running a particular line can tell by whom the work was done, although such knowledge is often important. I therefore suggest that legislation be enacted requiring all surveyors to register their marks with the Land Agent of the State. This would provide a central place where all marks were available, and where information could readily be obtained that would make it possible to identify the surveyor by whom any given line was run. Such a system of registration would not only be of immediate value, but perhaps of still greater value many years in the future in identifying the work of surveyors long since dead.

It would also be helpful to the general public and to surveyors themselves to provide means by which information could be secured as to qualified men. This might be arranged by making it optional for surveyors, after proper examination, to be licensed by the State Land Agent and recorded as registered surveyors. Lists of such surveyors could then be furnished on application to any one desiring them. While this arrangement would not prevent an unregistered surveyor from handling such work as he might be called upon to do, it would tend to safeguard the public against the employment of incompetent men and to protect competent surveyors against the competition of incompetent ones.

Shade and Ornamental Trees

LICENSING OF TREE SURGEONS

Shade and ornamental tree are at present not receiving the attention that their importance deserves. Trees of desirable species properly placed and cared for add greatly to the attractiveness of our streets and highways, and are a real asset on farms, estates, and other property. It is, however, important that such trees be protected from mechanical injury, insects, and disease, properly pruned, and when necessary cared for in other ways.

This fact, together with the growing interest in shade trees, has led to the development of "tree surgery," as the care of such trees is often called. A considerable number of firms and individuals now advertise to do work of this sort, and under present conditions there is nothing to prevent the public from being imposed on by ignorant or unscrupulous practitioners. Few persons know enough of the subject to be able to tell whether they are getting what they pay for or not.

I believe that it would be advisable to provide by law that hereafter no one shall advertise or otherwise solicit business as a tree surgeon until his fitness to handle pruning, spraying, the filling of cavities, and other work connected with the care of trees has been established by examination and he has been duly licensed by the State to practice. Such a requirement would serve as a protection both to the general public and to those tree surgeons who are competent to handle the work effectively. Unless some such safeguard is established, tree owners will be imposed upon and really able practitioners will suffer from unfair competition on the part of those who are either dishonest or incompetent. The official licensing of tree surgeons desiring to do business in the state is a step which has been taken elsewhere and which should be taken here. No objection to it can be raised by anyone actually qualified to practice.

ROADSIDE TREES

Since 1919 there has been a law (Ch. 219, P. L. 1919) providing for the designation as public shade trees of such trees within or upon the limits of any highway as may be regarded as particularly valuable for this purpose. Only a few requests have been received for the metal tags by which public shade trees are designated, and very little advantage seems to have been taken of this act. It furnishes a means by which cities and towns may protect their street trees, and action under it might well be taken much more generally than is now the case. Certainly the value of street trees is sufficiently great to warrant local communities in taking the necessary steps to protect them and keep them in good condition.

Another phase of the subject is the planting of shade trees along highways, both for aesthetic reasons and as a means of road maintenance. Treeless highways not only afford less attractive and less comfortable driving than tree-lined ones, but there are many places in which the shade furnished by roadside trees is an important factor in keeping them in good condition and in decreasing the cost of maintenance.

The State Highway Commission is interested in work along this line, but is not now in a position to take it up because of the danger of destruction of any trees that might be planted. Under the present law, roadside trees are the property of the abutting owner and can be removed by him at will unless designated as public shade trees. The public shade tree law, however, is not sufficiently broad and is not likely to be utilized generally enough to afford really adequate protection to planted roadside trees. It is therefore suggested that legislation be enacted authorizing the Highway Commission, with the advice of the Forest Commissioner, to undertake such roadside planting as in its judgment is advisable for the maintenance of public highways; and providing that trees so planted shall be the property of the State and that they cannot be trimmed, cut down, or removed except with the consent of the Highway Commission.

Summary

1. Maine's forests support its industries, protect its water supplies, stabilize its agriculture, harbor its inland fish and game, and attract its visitors. Their perpetuation is indispensable to the continued prosperity of the State.

2. As a result of fire, insects, disease, and cutting the forests are at present being rapidly depleted and are deteriorating steadily in quality. Unless this situation is corrected without delay, the long period required to bring a forest crop to maturity means that for many decades at least Maine's forests will not play the part which they can and should in its development.

3. Cooperation between the State and private timberland owners is essential to keep the forests continuously productive. The State, acting through its Forest Service, has three main functions,—law enforcement, education, and research. Its present activities in all three of these directions are restricted by lack of funds and should be greatly strengthened.

4. The fire protection work should be made more effective in many ways. These include:

More adequate field supervision.

Approval by the Forest Commissioner of appointments of town fire wardens.

Retirement of the outstanding Forestry District deficit.

Provision for State assistance to towns in forest fire emergencies.

Modification of the present slash law to provide for the disposal of slash by burning or such other method as may be approved by the Forest Commissioner, and to extend its application to all adjacent woodlands irrespective of ownership.

Prohibiting the building of camp fires without a permit from the owner of the land or from the Forest Commissioner.

- Authorizing the Governor to declare a closed season on fishing during unusually dry periods.
- Postponing the opening of the hunting season for big game until October 15, or preferably November 1.
- Providing a penalty for carelessness with fire in the woods.
- Requiring any one responsible for starting a fire to pay the cost of fire fighting.
- Requiring both portable and stationary mills within an eighth of a mile of woodlands to use spark arresters.

5. The present work in forest entomology should be expanded and put on a permanent basis. The recent destruction by the spruce budworm of two-fifths of the merchantable stand of spruce and fir pulpwood in the State, the practical annihilation by the larch sawfly some forty years ago of merchantable stands of larch, and the continuous damage being done by various insects attacking white pine, offer ample evidence of the need of investigations leading to practical control measures.

6. Measures for the control of the white pine blister rust should be extended to cover a wider area. The disease is now present throughout the white pine region, and can be prevented from doing much damage only by prompt and vigorous action.

7. Improved methods of cutting should be encouraged and investigations leading to better forest management conducted. Legislation prescribing specific methods of cutting is of doubtful value. A more flexible and effective method of public control would be to require that all cutting be done in accordance with plans approved by a publicly employed or approved forester. Because of the importance of the mountain forests in maintaining the water supply, these should be safeguarded by the creation of a commission authorized to determine the boundaries of protection forests and to approve the methods of cutting used therein.

8. The Department of Forestry at the University of Maine is now completing its twentieth year of creditable

service and has an enrollment of nearly one hundred students. The Department should be relieved of the handicaps of inadequate technical and clerical assistance and technical equipment under which it is now laboring, and put on a basis to function effectively. Much more should be done in the way of forest education among school children and the general public. An extension specialist in forestry should be added to the Extension Service of the College of Agriculture to assist the farmers of the State in practicing better forest management.

9. Provision should be made for administering the school and Indian lands for which the State acts as trustee on a more business-like basis than is now possible. Progress in the purchase of State Forests for watershed protection and for experimental and demonstration purposes should be made as funds are available.

10. There is general agreement that in the organized towns and plantations the taxation of both land and growing timber at full valuation under the general property tax tends to force the premature cutting of timber and to discourage the reforestation of cut-over lands. A thorough study of this situation and possible remedies should be made by a representative commission.

11. Provision should be made for the registration of land surveyors and their marks, and for the licensing of tree surgeons. Protection from cutting should be provided for roadside trees planted by the State for highway improvement.

12. Finally, there should be the heartiest cooperation between the timberland owners, the forest and wood-using industries, the State authorities, and the people generally in perpetuating the forests. If Maine is to live up to its motto of "Dirigo" in a field in which it should be preeminently a leader, it must attack its forest problem more vigorously than it is now doing.