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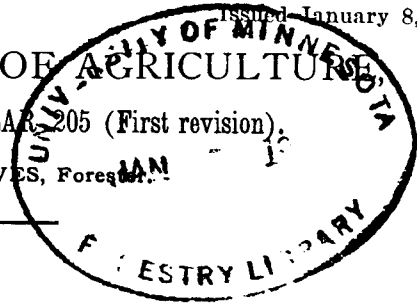
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HENRY S. GRAVES, Forester



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FOREST FIRE PROTECTION UNDER THE WEEKS LAW IN COOPERATION WITH STATES.

BY

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FOREST FIRE PROTECTION UNDER THE WEEKS LAW IN COOPERATION WITH STATES.

FOREST FIRE PREVENTION AND CONTROL.

The forest-fire season of 1912 marked the second year's operation of section 2 of the Weeks law. This section authorizes the Secretary of Agriculture to cooperate with States in protecting from fire the forested watersheds of navigable streams.

The importance of protection from forest fires is shown by the efforts being made to bring it about. The Forest Service is charged with the protection of 163 National Forests, aggregating nearly 200,000,000 acres. Eighteen States have effective forest-fire laws, enforced by efficient organizations under a State forester or a chief fire warden; seven others have made a start in this direction. Private owners in the Northeast and the Northwest have organized protective associations, each member of which is assessed for expenses according to the acreage of his holdings. Individual owners over the entire country are more and more realizing that not only is it practicable to protect their timber, but profitable also, because of its constantly increasing value. The joint efforts of all these agencies are reducing the fire risk and making the task of each easier.

It has been estimated that an average of 10,000,000 acres is burned over annually in the United States, with a money loss of about \$25,000,000. The loss in some States is enormous. In Wisconsin, during the three years prior to 1911, the losses were as follows:

Year.	Acres burned.	Value of merchantable standing timber destroyed.	Total loss of all forest products, including merchantable standing timber, young trees, and pulp wood, bark, logs, and similar products.
1908.....	1,209,000	\$2,997,000	\$9,194,000
1909.....	166,000	22,000	104,000
1910.....	892,000	997,000	5,000,000

Minnesota had in 1910 a loss estimated by the forest commissioner at more than 1,000,000 acres burned and nearly \$2,000,000 damage; Oregon lost in the same year, according to the State forester, nearly 2,000,000,000 feet of timber, with a value of about \$2,500,000.

CONTENTS.

	Page.
Fire prevention and control.....	3
The Weeks law, section 2.....	4
Administration of the law.....	4
Terms of the cooperative agreement.....	5
Work done in 1912.....	6
Results accomplished.....	9
Extending cooperative protection.....	10
APPENDIX.	
Form of agreement.....	12
Fire-plan map.....	14

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Forest fires generally have been regarded with indifference or as unavoidable. Too often life is lost and valuable property destroyed before the public is aroused to the danger.

In the coniferous forests of the North the destruction of merchantable timber over vast areas is frequent. In the pine or hardwood forests of the South the chief damage is the repeated killing of young growth, especially on cut-over lands. Such damage, unlike the destruction of the northern forests, is not as strikingly apparent, but the loss is, nevertheless, a severe one, because the young growth has a very great future value, and upon it depends the permanency of the lumber industry in the region.

Fire destroys also the soil covering; this causes rapid run-off on steep slopes, and erosion results. The soil thus washed out is the chief source of sediment in the channels of navigable streams. Forest fires, therefore, cause irregularity of streamflow and loss of navigability. This calls for active assistance from the Federal Government. Section 2 of the Weeks law is designed to authorize this assistance.

THE WEEKS LAW, SECTION 2.

The purpose of section 2 of the Weeks law is to protect navigable streams, through promoting forest protection by the States and by private owners. The appropriation for the purpose is \$200,000, which is available until expended. The law requires that (1) the protection must be confined to the forested watersheds of navigable streams; (2) the State must have provided by law for a system of forest fire protection; and (3) the Federal expenditure in any State must not exceed in any Federal fiscal year the amount appropriated by the State for the same purpose.

ADMINISTRATION OF THE LAW.

The law is administered by the Forest Service under an agreement between the Secretary of Agriculture and the State.

In the administration of this act the Forest Service places a broad interpretation on what constitutes a navigable stream, with the exception that streams used only for floating logs, canoes, or rowboats will not be considered navigable. As a general basis for decisions on the question of navigability the reports of the Chief of Engineers, United States Army, are used.

No State will receive more than \$10,000 in any one year. Nor should it be assumed that the Federal Government will duplicate within the limit any appropriation made by a State for fire protection. It is proposed to disperse the Federal fund as widely as possible, and throughout three years, in order that the educational value of the work may be fully realized. A fund of about \$20,000 has been reserved to increase allotments to States where an emergency due to unusual drought may occur. The expenditures in 1912 were about \$50,000. The allotments for 1913 will be about \$90,000.

In making the allotments consideration is given especially to the possibility of active assistance from private owners; to the amount of appropriation from each State; to the importance of the watersheds to be protected with respect to stream flow and navigation; to the relative area of the watersheds; to the kind and value of the forests; and to the relative fire risk. The States assisted must at least have initiated efficient fire protective organizations.

They must secure the cooperation of private owners in various activities, such as the hire of patrolmen, purchase of fire-fighting equipment, and the construction of lookout stations and telephone lines. The Forest Service takes the ground that before a region shall receive Federal aid the private owners must make a reasonable effort themselves. This requirement is most satisfactorily met by protective associations of timberland owners such as those in Maine, New Hampshire, Washington, and Oregon.

The aim is to assist each State as far as possible, helping especially the ones which have difficulty in providing efficient protection. The State which can make only a small appropriation may receive an amount equal to the sum which it appropriates; while the State whose appropriation is relatively large and which can of itself provide safe protection may receive a relatively small allotment.

Other things being equal, the more important watershed, or the larger area, or the more valuable forest, receives the larger allotment for protection, full weight being given in each case to the relative fire hazard.

TERMS OF THE COOPERATIVE AGREEMENT.

The standard form of cooperative agreement is given in full in an appendix to this publication. A specific agreement is made with each State with such variations in detail as local conditions require.

The State supplies the Forest Service with a comprehensive fire plan, which includes maps showing the areas to be protected, the headquarters and approximate routes of patrolmen, and all features necessary to a clear understanding of the State's plan of fire control. The appendix contains a map which forms part of the fire plan for northern New Hampshire.

Except for a nominal salary to the State forester, the expenditures made by the Federal Government are exclusively for the salaries of Federal patrolmen, including men assigned to lookouts, to railroad patrol, and to similar duties. The distinction between the Federal and the State patrolmen is advisable in order to simplify both the fiscal operation of the agreement and the inspection of the use of the funds. During wet periods, when patrol is unnecessary, the men are employed on other protective work, such as trail clearing, road making, and telephone construction. The State's expenditures that are to offset those of the Federal Government may properly include, however, any expenditures for protect-

ing forested watersheds of navigable streams from fire. These may be for the construction of lookout stations or other protective improvements and proportionate amounts of supervisory expenses.

The State forester or the officer of similar rank and duties is given a Forest Service appointment at a nominal salary, and he may employ Federal patrolmen and certify to their services on Government vouchers. These are submitted for payment each month and must be accompanied by duplicates of State vouchers to show the expenditures made by the State to offset those of the Federal Government; and an individual pay check is sent directly to each Federal patrolman. The State officer is given as much authority and latitude as possible in the expenditure of Federal funds. He is placed in practically the same position as a National Forest supervisor, by being allowed a wide degree of discretion and by being held fully accountable for results. He selects the Federal patrolmen, instructs them in their duties, and supervises their work.

The Federal patrolmen must be given such police powers for the prevention and control of forest fires as the laws of the State provide, they must be authorized to employ assistance in fighting fires, and they must be equipped with fire-fighting tools.

The Forest Service inspects the cooperative work on the protected areas. This is essential, since it serves to determine the efficiency of the plan of fire control and the effectiveness of the work done. Also it enables the Service both to give and to receive practical suggestions on the ground. The Service may, for cause, withdraw its approval of the expenditure of Federal funds on any area or terminate the Federal appointment of the State officer or of any Federal patrolman.

WORK DONE IN 1912.

The States which received Federal aid under the Weeks law in 1912 and the amounts expended by the Government are shown in the following summary:

State. ¹	Federal funds available for expenditure in States in 1912.			Expenditures in 1911 and 1912.	Unexpended balance of \$200,000 fund, Jan. 1, 1913.
	Allotments.	Expenditures. ²	Unexpended balances.		
Maine.....	\$10,000	\$6,514.50	\$3,485.50	\$16,506.30	
New Hampshire.....	8,000	7,720.90	279.10	13,940.40	
Vermont.....	2,000	1,997.15	2.85	3,215.15	
Massachusetts.....	2,500	2,489.00	11.00	2,854.00	
Connecticut.....	1,500	1,223.25	276.75	1,229.25	
New York.....	4,000	4,000.00		6,000.00	
New Jersey.....	2,000	1,977.33	22.67	2,967.33	
Maryland.....	2,000	649.00	1,351.00	918.00	
Wisconsin.....	5,000	4,113.00	887.00	8,550.25	
Minnesota.....	10,000	10,000.00		20,000.00	
Washington.....	10,000	2,818.75	7,181.25	2,818.75	
Oregon.....	10,000	7,103.05	2,896.95	10,408.05	
Total.....	67,000	50,605.93	16,394.07	89,407.48	\$110,592.52

¹ Negotiations were started with Kentucky, Montana, and Idaho, but no agreements were executed.

² Federal expenditures in each State were at least equalled and in most cases considerably exceeded by State expenditures.

Federal funds are rarely expended over an entire watershed, but only on those portions which have most protective value, or which are most liable to fire damage. The watersheds which received cooperative protection were the following:

Maine.....St. Croix, Narraguagus, Union, Penobscot, Kennebec, and Androscoggin.
 New Hampshire.....Androscoggin, Saco, Connecticut, and Merrimac.
 Vermont.....Connecticut, Otter Creek, and Hudson.
 Massachusetts.....Nashua, Thames, Connecticut, Housatonic, and Hudson.
 Connecticut.....Thames, Connecticut, and Housatonic.
 New York.....Hudson and Delaware.
 New Jersey.....Hackensack, Passaic, Delaware, and Raritan.
 Maryland.....Potomac and Youghiogheny.
 Wisconsin.....Chippewa and Wisconsin (headwaters of the Mississippi).
 Minnesota.....St. Louis, Rainy, Mississippi, and Red River of the North.
 Washington.....Columbia, Chehalis, Cowlitz, Snohomish, Duwamish, Willapa, Puyallup, Skagit, Stillaguamish, Nooksak, Hoh, Soleduck, and Grays.
 Oregon.....Columbia, Willamette, Nehalem, Willson, Siletz, Umpqua, Coos, Rogue, and Klamath.

Three hundred and eight Federal patrolmen were employed, of whom about 200 were on continuous pay from the date of appointment to the end of the season. They received from \$1 to \$3 a day. When not directly under the State forester, or warden, they were assigned to district wardens or rangers who supervised and inspected their work. The patrolmen are usually given specific written instructions as to routes of travel and other duties.

Each had a district to guard varying in area from about 25,000 to 100,000 acres. Without necessarily attempting to cover the whole district he made his rounds of the dangerous places on the most valuable areas at the most advantageous times. These routes varied from 10 to 40 miles a day, depending on the most feasible method of travel, usually by foot, horseback, or bicycle. Along the railroad lines, except where oil-burning locomotives were used, there was a special and constant patrol, in some places on foot and in others on railroad velocipedes or speeders.

The patrolman carries a map of his district and adjoining districts showing the major topographic features and the approximate location of the Federal and State patrol routes, patrolman's and fire warden's headquarters, telephone lines, lookout stations, roads, trails, and tool-supply boxes, or any features which might aid him in an emergency. He also must carry some fire-fighting tool, such as a shovel or a collapsible canvas pail.

The most important duties of the patrolman are putting out small fires, warning persons against setting or leaving fires, and recording their names when advisable. In the larger fires he has authority under the State law to call out help.

In addition to regular patrol duty and fire fighting, his work includes watching for fires from lookout stations, burning slash, and constructing protective improvements.

In most of the mountainous regions, especially in the Northeast, the lookout station is a highly developed feature of the State's fire protective system. It furnishes the primary control of the fire situation, while the patrol conducted in the valleys beneath forms the secondary control. The station is generally permanent, and consists of a lookout cabin or tower on top of a mountain, possibly with living quarters farther down where water can be had. The station is connected by telephone with the country below and with other lookouts, and equipped with field glasses, a map of practicable size, plane table, and alidade. Usually the watchman lives on the mountain, and during clear days is continuously on duty. In rainy or thick weather, when watching is not necessary or feasible, he is busy inspecting or repairing the telephone line or keeping clear the trail by which the line can be traveled quickly and damage to it located promptly. The watchman is supplied with a list of the names and telephone-call numbers of chief wardens, deputy wardens, patrolmen, watchmen, timberland owners, lumbermen, and all persons who may render help in the territory covered by the lookout; and he notifies the proper persons when he discovers a fire. From the mountain top he is generally able promptly to discover fires which might otherwise burn for hours and, perhaps, gather tremendous headway before they would have been detected from the lower valleys.

The practical value of the lookout station has been thoroughly tested; it is one of the best assets of a timbered country. Wherever possible the Federal Government prefers that its funds be expended for the salaries of lookout watchmen.

When there was no need for patrolling, the men were employed in the construction of protective improvements. In some States a great deal of work of this kind was accomplished in 1911 and 1912. An example of what may be done was furnished by Wisconsin.

There was practically no danger from forest fires on the cooperative area in Wisconsin after the middle of the usual dry season in either year. It would have been unwise to dismiss the patrolmen, since there was no telling when dry weather might come, and it would have been difficult to get hold of the same men again or others quite as competent. The improvement work, therefore, was pushed ahead rapidly to make the area more traversable and thus easier to protect. Nearly half of the area is State land included in the State forest reserve. The plan was to divide the more valuable portions, and those of greatest fire risk, into blocks of about 40 acres by constructing roads and fire lines so that the patrol force would have a

reasonably good chance of holding a fire within the block in which it started. The roads are about 3 miles apart, and from them fire lines extend to such natural fire barriers as lakes, rivers, and wet swamps. For the most part, the roads were built by removing the ties from old logging railroad grades and then leveling the grades with plow and drag. This network of old grades throughout a large portion of the cooperative area made road construction comparatively inexpensive. Where the roads will become main thoroughfares care was taken to build them

Lookout stations for primary control.

Telephone connections.

Protective improvements constructed.

Firebreaks constructed in Wisconsin.

for permanent use. Less expensive fire lines and trails seemed sufficient where fire protection was the only reason for their construction. There were constructed during 1911 and 1912 by the State and Federal patrolmen, with temporary help, over 159 miles of road and 118 miles of fire line.

A complete telephone system was planned and 56 miles of line were constructed, which connect a headquarters camp with distant and important lookout towers, ranger cabins, and summer resorts. This system will be still further extended during the summer of 1913.

Other important protective measures were the "brushing out" of trails; the cutting of old stubs, chiefly birch, for a distance of 6 rods on each side of 69 miles of roads and fire lines; the burning of dangerous slashings on 1,800 acres; and the construction of 5 bridges, 4 ranger cabins, and 4 lookout towers.

The cost of this work in Wisconsin was a little over \$26,000.

RESULTS ACCOMPLISHED.

There were many practical results of cooperation under the Weeks law. Hundreds of fires left by campers, fishermen, and hunters, or set by careless smokers and by locomotives, were discovered by the patrolmen and promptly extinguished. Great progress was made on permanent improvements that will simplify future fire control and prevention. But in addition to these tangible results, which have been apparent from the start, the educational value of the work although not measurable has been far reaching. Except in a few States, the last two years were the first when any systematic State patrol of the forests was conducted. It marked the general extension of the State organization cooperating with the Federal Government in getting out among the people; in educating them, through the actual work done, of the need and value of fire protection; and in encouraging their cooperation.

The most effective work of the patrolmen was in warning persons met in the woods of the danger of setting fires, and informing them of the fire laws. The patrolmen were generally instructed to record the names and addresses of fishermen, hunters, and campers whenever possible and to send them to the district chief. In New Hampshire, in 1911, 4,200 warnings of this sort were given; more than half the names were recorded, and forwarded to the office of the State forestry commission. Before the fire season of 1912 a copy of the fire laws was sent to each of these persons.

Sportsmen, loggers, and others who travel the woods are taking greater care in the use of fire; quicker notifications of fire are given to the proper State officer, while before they at best were desultory. Many private owners who were skeptical at the start later saw the practical value of the work and began cooperating in it and contributing toward it. The increased interest of the public was shown by the widespread demand for information on fire protection received by the various State foresters and by the Federal Forest Service.

The public is educated.

Warnings given.

Greater care by public.

The first direct result of the Weeks law in encouraging State legislation was the passage by the Connecticut Assembly of the following act:

State legislation encouraged.

CHAPTER 292.

AN ACT CONCERNING PREVENTION OF FOREST FIRES.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

SECTION 1. The State forest fire warden may take such action as he may deem necessary to provide for the prevention and control of forest fires in groups of towns, and is hereby authorized to enter into an agreement with the Secretary of Agriculture of the United States, under authority of the act of Congress of March 1, 1911, for the protection of the forested watersheds of navigable streams in this State. Said State forest fire warden may appoint patrolmen, who shall receive not more than twenty-five cents per hour for time actually employed, and may establish and equip fire lookout stations and furnish necessary equipment for such patrolmen.

Sec. 2. Any patrolman appointed for such purpose by said State forest fire warden may arrest, without warrant, any person taken by him in the act of violating any of the laws of this State for the protection of forest and timber lands.

Sec. 3. The disbursements of the State forest fire warden in carrying out the purposes of this act shall be paid by the State from the appropriation for fire wardens.

Sec. 4. This act shall take effect from its passage.

Approved, September 26, 1911.

The first question that naturally occurs to one looking for measurable results is how far the expenditures succeeded in preventing fire losses. Maine and New Hampshire furnish striking examples of comparative losses in 1903 and 1911, two of the most dangerous fire years on record in these States. The comparison is based only on the watersheds where cooperative fire protection between the Federal Government and the State and timberland owners was established last year.

Practical results in saving property.

Year.	Season of drought.	Maine.		New Hampshire.	
		Acres burned.	Damage.	Acres burned.	Damage.
1903	Apr. 17 to June 6.....	172,040	\$679,423	84,255	\$200,000
1911	Apr. 16 to June 1, June 20 to July 17.....	91,471	154,284	10,925	34,038

While the danger season of 1911 was longer and generally considered to be the more severe, the area burned over and the amount of damage were considerably less than in 1903, and the decrease without doubt can be attributed in great measure to the protection afforded in 1911, as compared with the almost utter lack of it, except by a few private owners, in 1903.

EXTENDING COOPERATIVE PROTECTION.

The Federal Government desires to extend this cooperative protection to other States. To secure its benefits they must enact a forest-fire law and must appropriate funds for administering it.

Few more effective steps could be taken by many States toward the conservation of resources which support important industries than to inaugurate systematic fire protection. The fact that the immediate financial interests of timber owners make them backward in undertaking this insurance of their industry is an additional reason for the States to take the lead. The readiness of the Federal Government to cooperate with the States, under the terms of the Weeks law, as soon as the State makes a start, is an incentive to immediate action.

The States should take the lead.

A State forest-fire law should provide, in addition to an organization to fight fires, a patrol force for fire prevention.

What a fire law should provide.

A general defect in fire laws is that they provide only for fighting fires and not for patrol. The law should, of course, carry an adequate appropriation; the most serious defect has been the inadequacy of appropriation. To protect the National Forests costs about 2 cents an acre annually; the Biltmore tract in North Carolina, about 5 cents an acre; and the lands of the various timberland protective associations in the Northeastern and Northwestern States, from 2 to 4 cents an acre. It is probable that the State can secure efficient protection for 1 cent an acre, if the larger private owners will assist by contributing toward the protection of their own lands. If, for example, a State contains 5,000,000 acres of forest land which needs protection, an annual expenditure of \$50,000 should be sufficient to handle the work effectively. It is improbable that a State would appropriate this amount at the beginning; an appropriation of \$10,000 or even less would be sufficient to start the work and demonstrate its value.

Cost of protection.

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APPENDIX.

FORM OF AGREEMENT.

The form of agreement between the Secretary of Agriculture and the State for the protection from fire of the forested watersheds of navigable streams is as follows:

UNITED STATES DEPARTMENT OF AGRICULTURE.

Agreement for the protection from fire of the forested watersheds of navigable streams under section 2, act of March 1, 1911 (36 Stat., 691).

This agreement, made by and between the Secretary of Agriculture of the United States, under authority of section 2 of the act of Congress approved March 1, 1911 (36 Stat., 691), and the State of ----- by and through its State Forestry Commission, witnesseth:

That whereas the said State has requested the cooperation of the said Secretary in the protection from fire of the forested watersheds of navigable streams; and

Whereas the said State has provided by law for a system of forest-fire protection;

Now, therefore, the said parties do mutually promise and agree with each other as follows:

1. To establish and maintain a cooperative fire-protective system covering any or all private or State forest lands within the State of ----- and situated upon the watersheds of navigable rivers; and to furnish for this purpose Federal and State patrolmen or to take such other protective measures as may be deemed advisable, under the conditions hereinafter provided.

2. The State commission shall furnish maps showing the watersheds and areas which are proposed to be protected under this agreement. The cooperation shall be limited to such watersheds and areas in so far as they shall be approved by the Secretary. The said commission shall indicate the periods during which protection from forest fires is proposed under this agreement; the number of patrolmen, with their stations, which will be employed by the State; the character and extent of other protective measures which it is proposed to put into effect at the expense of the State; and the localities in which it is desired to place Federal patrolmen furnished by the Forest Service.

3. The State forester of -----, acting as an employee of the State commission, shall be appointed collaborator in the Forest Service of the United States Department of Agriculture at a salary of one dollar (\$1) a month, and acting in such capacity shall have direct charge of the force of Federal patrolmen employed under this agreement. The State forester shall select the Federal patrolmen, subject to approval by the Secretary, instruct them *in writing* as to their duties, supervise their work, and certify to their services on pay rolls of the Forest Service.

4. The Federal patrolmen so selected shall be appointed as temporary laborers in the Forest Service at a per diem rate not exceeding ----- dollars (\$-----); provided that they shall be employed exclusively in the protection of areas on the watersheds of navigable rivers which shall have been approved by the said Secretary.

5. This agreement contemplates the employment under ordinary conditions of fire hazard of not to exceed ----- Federal patrolmen, or in case of emergency of not to exceed ----- Federal patrolmen in the discretion of the collaborator, provided that in case of serious emergency the latter number may be increased with the approval of the Forester.

6. The State commission shall secure for the Federal patrolmen furnished under this agreement, by appointment as deputy State fire wardens or otherwise, without additional compensation, such police powers for the prevention and control of forest fires as may be granted under the laws of the State of -----, and shall equip such Federal patrolmen with such fire-fighting tools or devices and shall authorize them to employ such assistance in fighting fires as its funds and the State fire laws and regulations will permit.

7. The total sum to be expended by the Federal Government during any Federal fiscal year for the purposes of this agreement may equal but shall not exceed ----- dollars (\$-----); but in no case shall the amount expended by the Federal Government in any Federal fiscal year exceed the amount appropriated by the said State for and expended by it during the same period for the purpose of protecting from fire forested watersheds of navigable streams in said State. This agreement contemplates an expenditure of State funds of at least ----- dollars (\$-----); and in the event of such expenditure falling below said amount the Federal expenditure will be decreased proportionately.

8. Payment for the services of Federal patrolmen employed under this agreement shall be made at the end of each calendar or fractional month on vouchers certified by the State forester as collaborator, and forwarded to the Forester, Forest Service, Washington, D. C., provided that no patrolman will be employed, except during the real danger season from forest fires on the watersheds and areas approved by the Secretary under this agreement.

9. The said Secretary and his authorized representative shall have full authority to inspect the protective areas and the force herein authorized, and at his option, by giving the State commission written notice, may withdraw his approval of any such area or portion thereof, or terminate the employment of any Federal patrolman or patrolmen or of the State forester as collaborator in the Forest Service.

10. The State forester shall be responsible for seeing that each patrolman keeps a vigilant lookout for forest fires in or threatening his district, and that he makes every possible effort to extinguish such fires as occur whether they are on lands belonging to the State, the Federal Government, or a private owner, provided that during the patrol period when in the judgment of the State forester patrol is unnecessary the patrolmen may be used on other fire-protection work. The State forester or his representative shall from time to time make such personal inspection of the cooperative fire-protection work done under this agreement as may be necessary to promote the effectiveness of said work.

11. The said State forester shall, with respect to all private forest land afforded protection against fire under this agreement, use every proper means to bring about the active cooperation of the owner in such protection, including aid from him in the form of hire of one or more patrolmen, construction of permanent improvements, and the like.

12. Both the State commission and the Forest Service of the United States Department of Agriculture shall have equal right to publish the results of the cooperation under this agreement: *Provided*, That any results intended for publication, except press notices of momentary or local interest, be approved by the commission and by the Secretary. In all such publications it shall be plainly stated that the results were secured through cooperation between the commission and the Secretary.

13. This agreement shall become effective on the ----- day of -----, 191--, and shall continue in force thereafter, subject, nevertheless, to the availability of funds appropriated by Congress by the act of March 1, 1911, for the purposes herein mentioned, and to any amendments which may be made hereof by mutual agreement of the parties; and it is expressly understood that this agreement or any modifications hereof may be terminated by either party upon thirty (30) days' written notice to the other.

In witness whereof the said commission has hereunto caused its name and seal to be affixed by its proper officers, on the ----- day of -----, 191--, and the said Secretary has hereunto set his hand and affixed his official seal on the date below written.

President, State Forestry Commission.

Secretary of Agriculture.

Signed and sealed by the Secretary of Agriculture this ---- day of -----, 191--.

FIRE-PLAN MAP.

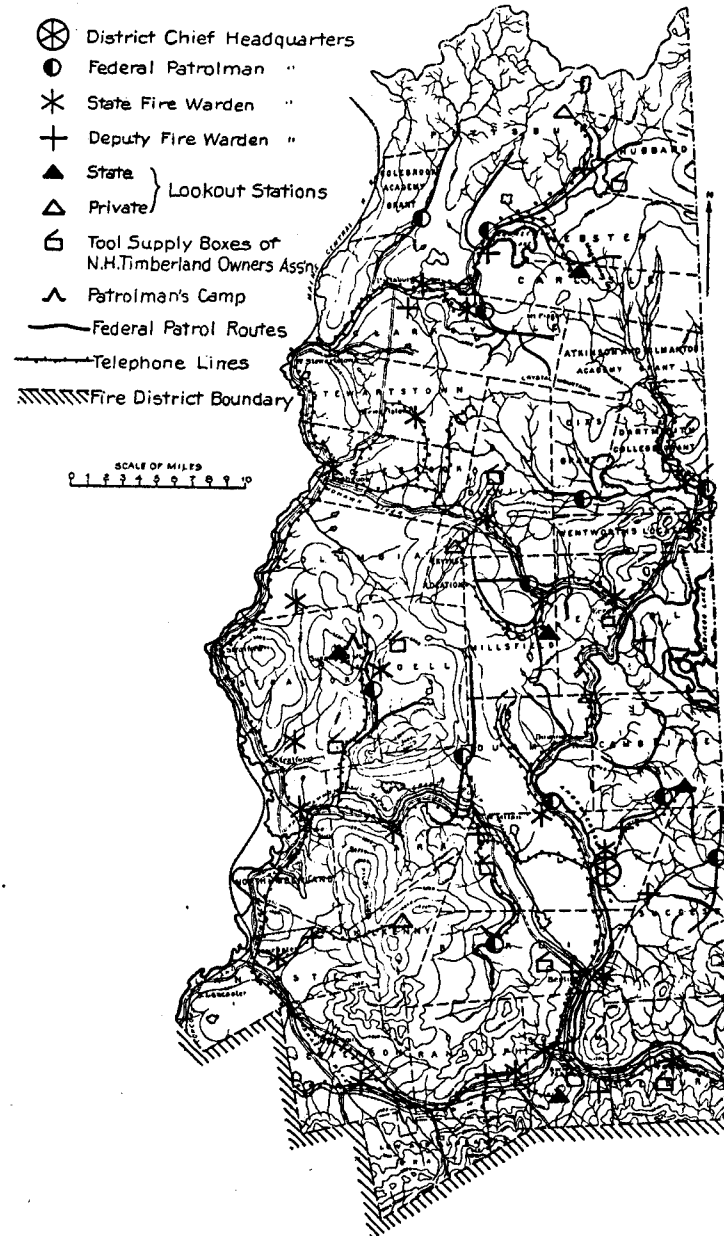
The accompanying map of the northern district of New Hampshire, including a portion of the cooperative watersheds, is an example of the kind which should accompany a fire-protection plan. The map shows, in addition to the headquarters of members of the fire force, the routes of patrolmen and the location of lookout stations, telephone lines, and tool-supply boxes.

This district has an area of approximately 1,000,000 acres. It is supervised by a district chief, under whom are patrolmen, lookout watchmen, and fire wardens. In this district in 1912 the expenditures for fire protection were as follows:

State.....	\$4,850
New Hampshire Timberland Owners Association.....	5,270
Federal Government.....	2,580

Total..... 12,700

At \$12,700 for the protection of 1,000,000 acres, the rate is about $1\frac{1}{4}$ cents per acre.



Fire-plan map of the northern district of New Hampshire.