

Fire Protection Administration For
Private and State Land in Oregon

by

Alfred H. Murphy

A Thesis

Presented to the Faculty

of the

School of Forestry

Oregon State College

In Partial Fulfillment

of the Requirement for the Degree

Bachelor of Science

June 1941

Approved:

Professor of Forestry

Permanized
OLD RELIABLE BOND

ACKNOWLEDGEMENTS

Much of the material and ideas which have been included within these pages has been obtained with the assistance of people engaged in forestry activities. In appreciation of this help the following are recognized as persons who contributed much valuable information: K. F. Williams, Superintendent, Forest Fire Control, State of New York, Conservation Department; H. W. Mac Kenzie, Conservation Director, State of Wisconsin, Conservation Department; Arthur M. Emmerling, Assistant Forester, Arkansas Forestry Commission; George H. Wirt, Chief Forest Fire Warden, Commonwealth of Pennsylvania, Department of Forests and Waters; I. S. Booth, Michigan Department of Conservation; Austin H. Wilkins, Supervisor, State of Maine Forest Service; L. T. Webster, Field Assistant, State of Washington, Department of Conservation and Development; Franklin Girard, State Forester, State of Idaho, Cooperative Board of Forestry; J. H. Walker, Secretary-Warden, Eastern Lane County Fire Patrol Association; J.F. Kimball, Secretary-Treasurer, Klamath Forest Protective Association; Theodore Rainwater, Coos County, Fire Patrol Association; and H. O. Pargeter, Douglas County Fire Patrol Association.

In addition to the above state and county agencies valuable information on the subject and thesis writing

was received from W. F. Mc Culloch and G. H. Schroeder
both of the School of Forestry at Oregon State College.
Valuable assistance was also given by William E. Mc Cann
in critizing the structure of the thesis.

Contents

Introduction -----	1
History of State and Private Protection -----	3
Present state administration -----	13
Land protected -----	13
Financial status -----	14
Administrative organization -----	15
Present association administration -----	20
Land protected -----	20
Financial status -----	21
Administrative organization -----	23
Problems and possible solutions -----	24
Law -----	26
Clarke-McNary -----	26
Fulmer act -----	27
Land classification -----	28
Land acquisition -----	31
Administration -----	33
Civil Service -----	33
Board of Forestry -----	35
Field administration -----	37
Protection -----	41
Personnel -----	41
Training -----	44
Crews -----	45
Finances -----	47
Conclusions -----	51

Fire Protection Administration For Private and State Land in Oregon

Introduction.

The purpose of this paper is to present a descriptive survey of the legal and administrative machinery for fire protection on private and on state lands in Oregon, and a critical estimate to show where more efficient organization would make the system more effective.

It is extremely important that definite objectives should be set up as an ultimate goal in the field of state forestry, for by keeping definite ends in view intelligent plans can be made to reach a clearly conceived goal more quickly. Too many of our governmental activities in the past have been based on a trial and error, or hit and miss, method which has been not only a source of delay but also a cause of higher costs than ought to be necessary. Even today the plan for state fire protection falls far short of what is desirable for best results, although many men in the state organization have attempted to remedy the situation -- against insurmountable odds. It would be presumptuous, in view of these facts, to pretend that this paper can offer a complete and adequate solution of the problem, but it is by no means impossible to offer suggestions which would go far towards

clarifying that goal mentioned above.

In any state such as Oregon, where about 50 per cent of the land is forested, two points are immediately obvious: first that the problem of protection is a matter of vital importance to every citizen of the commonwealth, and secondly that each citizen should have brought home to him how fire protection directly concerns his own welfare. Strange to say, one source of public indifference in the past has been the enormous amounts of timber -- an amount so vast that protecting it seemed a thing of minor importance. The same misconception prevailed in the Eastern and the Lake States years ago, but bitter experience has brought them to see the folly of leaving forest protection to chance. Here in Oregon it is still not too late to correct our wrong attitude, and to begin fostering corrective measures that will lead eventually to a sound protection policy. If this paper merely gives the wheels of progress a small initial whirl in the right direction its purpose will have been more than realized.

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED
DATE 10-15-80 BY SP-6 BJS/STP

History of State and Private Protection

The history of fire protection in Oregon has been made within the last thirty-four years. It seems rather odd that a state so rich in forest resources should have begun to manifest interest in forest protection such a relatively short time ago, for the story of forest protection in Oregon really begins in 1907 when the first State Board of Forestry was formed. Prior to that time what little protection had been undertaken was administered by the State Game and Forest Wardens. Their efforts could hardly be called enforcement since there was a grievous lack of effective laws to be enforced. Finally the State Legislature created the State Board of Forestry, carrying an annual appropriation of \$500. While this sum was far too low for any material protective measures, it represented at least a beginning, and it is hard to believe that it was seven years after the turn of the century before this much was accomplished. It is readily granted that a few localities had some sort of fire protection before the formation of the State Board of Forestry, but this only emphasizes the fact that not until the formation of the State Board was there any thought of unified and efficient protection. With such a limited appropriation, the Board was able to do little more than publicize fire protection in

the hopes of gradually encouraging larger appropriations. Their hopes were unexpectedly encouraged by the disastrous fires of 1910.

In the summer of that year the fact was brought home emphatically to the people of Oregon that something had to be done to protect their forests. An extremely dry fire season and the virtual absence of any organized protection permitted fire to rage with such unchecked fury that they destroyed countless thousands of dollars worth of timber. The year 1910 was memorable for fire losses. Pressure from timber owners and other interested citizens plus dread of a repetition of the disaster induced the State Legislature to act with the greatest decision and begin actively to frame suitable measures to cope with the protection problem. In 1911 the legislature reorganized the State Board of Forestry, provided for the appointment of state fire wardens, established a fire season, declared that inadequately protected land was a nuisance, regulated the building of campfires, required permits for burning and other-wise desposing of slash, and required that logging engines use spark arrestors. In addition to enacting these provisions for safety in law, the legislature also made an appropriation of \$60,000 for properly carrying out its enactments.

The state thus gave the impetus for an active fight against the fire menace and the movement was.

taken up during 1912 by private fire protection associations. Before that year three associations were already in existence and others were quickly formed so that the addition of patrols in Linn County, Douglas County, Western Lane County, Clackamas-Marion County, and Columbia County brought the total number of private associations for 1912 to eight. These were larger units, but also several small units protected limited forest areas. Meanwhile, the State Forester appointed supervising fire wardens in counties where there was a quantity of timber sufficient to warrant the service of such a warden.

In 1913, the State of Oregon received an allotment of \$10,000 from the fund provided by the Weeks Law. This federal aid made it possible for the State Forester to hire fifty-eight more men in addition to those hired under the state's allotment of \$60,000. When the Forest Code had been in operation for a period of two years, it was discovered that a great number of forest owners were not contributing their share towards fire protection. This condition was so inequitable that the legislature found it necessary to pass the Compulsory Patrol Law. Under the provisions of the new law, each land owner holding a given amount of timbered land was obliged to pay his just share of the cost of protection. Fire patrol fees were collected by the State in the same manner as ad valorem taxes

and were then paid over to associations protecting the land. As a sanction for the execution of the law, if an owner fails to pay this assessment the state holds a lien on his property until the payment or payments are made up.

Once started, the protection movement continued to advance. During 1913 several more associations were formed for timber protection in Baker County, Clatsop County, Deschute Valley, Josephine County, Lincoln County, Polk County, and Union- Wallowa County. Certain lands in eastern Oregon not protected by associations were taken care of by specially provided state patrols.

In 1915, after protracted legal proceeding, the government took over the O & C and Coos Bay land grants because they had been mismanaged under the terms pursuant to which they had been originally granted. These vast grants consisted of odd sections of about two and a quarter million acres in western Oregon. Since most of the land was incorporated with association land, during the first year Congress appropriated \$25,000 for its protection.

Meanwhile a change was taking place in the amount of allotment for forest protection from the federal government. The original allotment of \$200,000 under the Weeks Law was still in effect, but as more and more states became eligible to draw on the fund, the amount

to each state had to be reduced. Thus in 1919 the allotment to Oregon through the Weeks Law fell to \$7,000 -- not because Oregon was spending less money for protection, but because a greater number of states were now applying for funds. Furthermore, in this year the cost of protection went up, probably because World War I had just been concluded. For example, before 1917 costs for protection had amounted to two cents per acre, but through shortage of labor and increasing cost of supplies and equipment the later range of prices was from 3½¢ per acre to 5¢ per acre.

Little by little, as time went on, there were persistent signs of increasing interest and efficiency in measures for protection. For instance, in 1920 an important adjustment in the O & C administration was made, under which the annual appropriation for fire protection would apply to all O & C land without discrimination. Previously, allotted funds could be used for protecting timbered lands only, but the new ruling protected brush land along with the timber.

The year 1924 saw the Clarke-McNary Law substituted for the Weeks Law. Notable among the provisions of the new law were measures to enhance effective cooperation in prevention and suppression of forest fires, to make funds available for federal land purchases, to collaborate in the distribution and growing of forest seeds and plants for reforestation, and to

proffer aid to the owners of woodlots.

The legislature reorganized the old forest code in 1925 by adding such provisions as the following: Penalties for throwing lighted material on forest lands; requiring logging camps to be provided with fire fighting equipment and logging engines to be fitted with ash-pans; making refuse burners mandatory at sawmills, and many minor particulars. In the same year another law was passed which permitted the state to acquire lands through gifts, purchase, or transfer of title to the state by various counties. Passing this law makes it possible for the state to establish state forests in suitable locations.

It is quite obvious that by this time the attitude of the public and of the lawmakers was radically different from what it had been in 1907. Another progressive step in forestry regulation was taken in 1929 when the Oregon legislature passed the Reforestation Tax Law. Referring to this law, Colonel W. B. Greeley made the following statement: "The principle of a low fixed annual land tax supplemented by a yield tax on forest products ultimately harvested, appears to be the best basis yet developed in a nationwide study of forest taxation as at least the starting point in encouraging private ownership." (9) The main purpose of the law were as follows: To encourage reforestation on land not suited to other uses; to provide a

fair and stable tax while any crop was growing and a yield tax when it was cut; to encourage owners to retain land in order to grow future crops; to promote natural reforestation on land, and to protect land from fires under present state laws. Through the application of this law, many acres were continued in private ownership and thus contributed their share to the costs of protection. Without this law, many land holdings would revert to a delinquent condition and would prove to be a burden upon organized protection.

In certain years the cost of fire suppression becomes excessive. While reasons for increased cost are generally understandable, nevertheless certain of the associations faced a grievous difficulty during such years. Under existing regulations, the excessive cost of suppression forced the association to levy a higher assessment, which, for some owners, would amount to an increase of one hundred percent. Certain owners simply could not meet the assessment and were forced to go delinquent, with the immediate effect of shifting a still greater burden upon the owners of the remaining land. It is significant of the growth of public opinion on the question of forest protection however, that even such a critical situation was not permitted to nullify the gains already made.

A plan was devised under which a specific and uniform amount was to be collected each year rather than

by changing radically from year to year. It was confidently hoped that a greater return would result from the uniform charges on land. To forestall the danger of bankruptcy, an agreement was drawn up in such terms that fire fighting costs could be spread over all the land of all the associations. This momentous covenant was signed in 1930 by all the member associations of the Oregon Forest Fire Association. It amounted to a mutual insurance company in which each association contributed to a central fund which would be used to stabilize excessive costs of fire prevention in any given year.

The story of the summer of 1933 makes a very dark page in the history of organized protection in Oregon, for in that year occurred the disastrous Tillamook Fire. The blaze started at the scene of a logging enterprise that should never have been operating in such extremely hazardous weather. There is no need to repeat the sorry tale of this catastrophe, but it was with this disaster before their eyes that the legislature took a number of decisive steps in legislation toward increased fire protection. Under one law, the Governor, with the advice of the State Forester, could proclaim certain areas closed to entry or use without an official permit. Similarly, the Operator's Permit Law was passed in the same year, 1933, providing that woods operations in western Oregon could be conduc-

ted only after a permit had been obtained from the State Forester. Under the law, the State Forester has authority to see that precautionary rules against fires are enforced, and the right and duty to close down all operations when weather conditions are menacing.

This year also saw the beginnings of the CCC under federal direction. The gains made were not permitted to be lost. Assistance in fire protection and improvement in equipment and quarters during the following year did much to supplement the efforts of the state and of the associations.

The next year, 1934, the Forestry Board of the Oregon State Planning Board made a study of forestry problems in order to determine what steps might be necessary to insure permanent industries and communities in the state. The finding of this Board will remain the basis for many future legislative problems on forestry and will contribute not a little to the final solution of them.

Additional amendments were added to the forest code in 1937, among them a provision for increasing the Board of Forestry by one member and a provision for appointing assistant state foresters; a change in the dates designating the fire season, and power to appoint county forest land classification boards. The amendments furthermore gave counties express authority to administer and manage forest lands owned by the county.

The year 1937 will also be remembered as the period in which Congress turned back to the Department of the Interior the protection of O & C lands, which had been doing well under the jurisdiction of the Forest Service. This change of jurisdiction called for a new arrangement with the O & C administration for protection costs.

The growing maturity of outlook upon forest problems appears in the Forest Land Acquisition Law of 1939. This very recent legislation included the following provisions: It authorized the State Board of Forestry to acquire lands for the purpose of developing state forests, to proceed with the actual development and management of such lands, to sell any and all forest products, to lease lands and permit the use of them for grazing, recreation, and other purposes, to make adjustments for delinquent fire patrol liens that had accrued on tax foreclosed lands, and to cooperate with the federal government in carrying out the terms of the act.

While the above account is necessarily very summary, it serves to bring up to the present the description of the State Forestry Department with sufficient detail to provide a background for discussion.

Present State Administration

Land Protected.

At the present time there are two units protected directly by the State Forester at Salem. One of these units is located in the northeast part of the state and consists of land not protected by associations or as national forest lands. The second is known as the southwest Oregon unit, lying in Josephine and Jackson Counties. The lands under protection are in possession of a considerable number of owners and are classified, with regards to protection, in a variety of ways. The first classification is a type of land called tax roll land, which is defined as privately owned timber land for which the owners have failed to provide protection through private patrol or association membership and for which this work is performed by some other agency. The second classification is a type of land known as private patrol land. While this type usually provides its own patrol, certain parts may be protected by the state or in cooperation with state agencies. The third classification embraces county lands which, as a rule, have come under county ownership through tax foreclosure. There is a fourth type of land, namely O & C properties, that is, land obtained from the holdings of the Oregon and California Railroad Grant and Coos Bay Wagon Road Grant, revested under the administration of the Department of the Interior.

And finally a classification must be added which included all vacant public land.

State protection in 1938 for these several classification may be segregated as follows:

Type	Acres
State land -----	88,587
Tax roll -----	1,348,690
Private patrol -----	29,368
County land -----	107,228
O & C land -----	364,872
Public domain -----	<u>180,621</u>
Total-----	2,119,366

Excepting national forests, parks, and Indian Reservations, it is significant to note that the state directly protects only 19 percent of the total acreage of forest land in the state that is protected by associations and state agencies. In other words, the state forestry department in Salem has only limited control over the greater part of fire protection on the forested land of the state.

Financial status.

The money necessary to maintain the State Forestry Department and all its functions is derived from a number of different sources. One of the larger sources of funds is legislative appropriation which give rise to what is often entered under the heading State General Fund. The amount received from this source tends

To vary from year to year, depending on whether the legislative body happens to be in an economical frame of mind or conservation minded. Another source of revenue is receipts and collections from tax roll land in the form of an assessment of a certain amount per acre to be collected with the regular property tax. The third source of revenue is federal government. Embraced within this classification are O & C lands, Clarke-McNary lands, public domain, and land protected by the state under Forest Service contracts. There is a final source of revenue derived from county lands protected by the State Forestry Department. According to statistics for 1938, the receipts from contributing agencies for state protection was as follows:

Type	Dollars
Legislative appropriations -----	10,420
Tax roll land -----	25,740
Federal government -----	23,835
County land -----	<u>3,771</u>
Total -----	\$63,766

In addition to the above, it might be well to mention that money may also be drawn from what is called the Emergency Fire Control Fund which functions as immediate source of supply in extreme emergencies during the fire season.

Administrative organization.

The State Department of Forestry is the all -

inclusive organization under which numerous functions are exercised by various subordinate groups. At the top is the Board of Forestry consisting of nine members including the governor who is their ex-officio chairman. The eight members of the Board represent the following organizations in Oregon: The School of Forestry at Oregon State College, the Oregon State Grange, the United States Forest Service, the Oregon Forest Fire Association, the West Coast Lumberman's Association, the Oregon Wool Grower's Association, the Western Pine Association, and two represented by a single member, namely the Western Oregon Livestock Association and the Oregon Cattle and Horse Raisers Association. The members of this Board of Forestry are appointed by the Governor of the State on the recommendation of the organizations named above. Not only the Governor but the representative of the School of Forestry are ex-officio members. The tenure of office of members of the Board is not fixed and while the members do not receive any compensation for their services, they are given an allowance for travel. The Board convenes whenever conditions warrant a meeting, as, for example, when expert advice is necessary on forestry questions. It is the duty of the Board to appoint a State Forester and to be answerable for his actions while he is in office. The Board also has plenary power to formulate the policies and dictate the actions of the Department

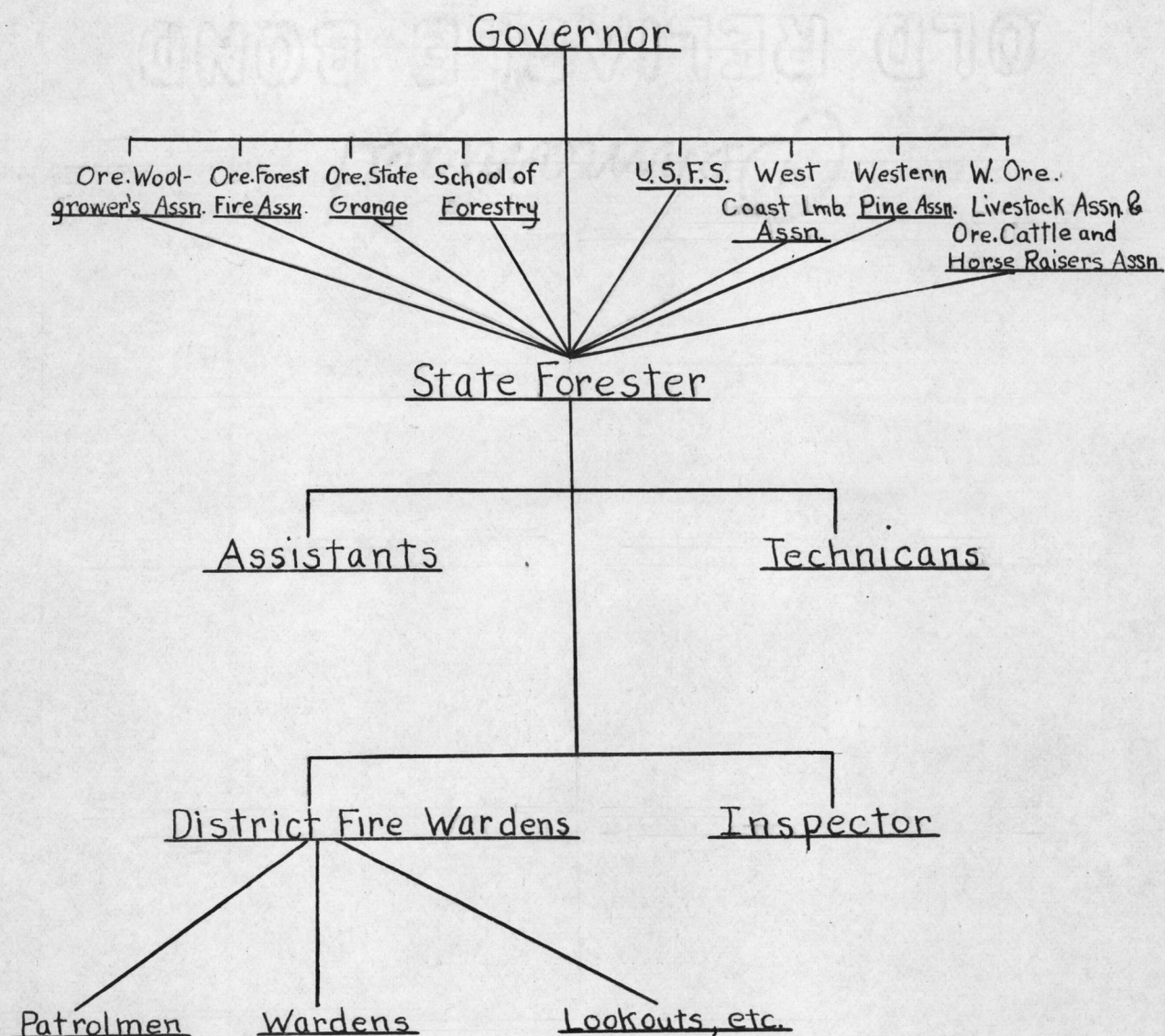
of Forestry. Subordinate administrative personnel and functionaries such as technicians, assistants, and district wardens are appointed by the Forester.

At the present time the State Department of Forestry has four assistant foresters assigned to four separate departments: A Fire Control Department, a Department of Prevention, a Fiscal Relations Department, and a Technical Forestry Department. The duties of these departments may be summarized as follows: The Fire Control Department makes contracts for procuring and maintaining suitable equipment, trains personnel, administers dispatching of men and equipment, and carries on like activities connected with fire control. The prevention Department acts as an executive agency for law enforcement and hazard removal, but does not engage in education work. The Department of Fiscal Relations manages all matters pertaining to accounts, taxes, fees, disbursements, receipts and the like. Finally, the Technical Forestry Department is the administrative agency for all problems involving silviculture, reforestation, Clarke-McNary provisions, state forests, farm forestry and all allied fields.

After the State Forester has selected the District Warden he must in turn choose his own staff of assistants: fire wardens, patrol men, lookouts and others, within the limits of his authority, that may be necessary. The State Forester or his assistants also appoint

inspectors. Their function is to assist the District Warden in law enforcement and inspection, especially in areas where a substantial amount of lumbering is done. The extent of this inspection may be gathered from the fact that in 1938 the state employed fifty fire wardens together with the personnel just mentioned under the jurisdiction of each of them. Better to illustrate the state organization, the accompanying diagram has been prepared, listing employees according to the authoritative body or person who appoints them.

State Organization



Present Association Administration

Land protected.

In 1938 there were twelve associations protecting land in various parts of the state. Of these twelve associations, three are located east of the Cascade mountains and the remaining nine are located west of the same range. The three associations in eastern Oregon are the Black Butte Fire Association, at Bend, the Klamath Forest Protective Association at Klamath Falls, and the Walker Range Patrol Association at Lapine. Those in western Oregon are the Clackamas-Marion Fire Patrol Association, the Linn County Fire Patrol Association, the Northwest Oregon Forest Protective Association, and the Western Lane County Fire Patrol Association, all with headquarters in Portland. To these must be added the Coos County Fire Patrol Association, the Douglas County Fire Patrol Association, the Eastern Lane County Fire Patrol Association, and the Polk County Fire Patrol Association. Since the formation of the associations in 1907 there have been many changes in the areas they protect and the size of their local organization.

In the following analysis of the amount of land protected and the cost of protection, all associations are combined in order to simplify the procedure. The amount of land protected in 1938 may be tabulated thus:

Type	Acres
Association -----	3,026,262
Tax Roll -----	2,984,280
Private Patrol -----	642,655
County -----	678,812
O & C -----	1,202,803
Public Domain -----	321,681
State -----	<u>118,931</u>
Total -----	8,975,424

This total of acreage is 81% of all state and private protected land,

Financial status.

Revenues are derived from approximately the same sources as those of the state, except that a substantial amount is levied from association members. Such a statement is so vague however, that a table will be useful to illustrate the amounts received from various sources during the year 1938:

Type	Dollars
Association members -----	90,329
Tax roll land & contracts -----	75,981
Federal government -----	80,659
County land -----	15,884
State land -----	466
State general fund -----	59,028
Central control fund -----	99,205
Miscellaneous -----	422,203

A few notes may be helpful in clarifying the above tabulation. Association membership designates members who pay protection costs voluntarily on the basis of acreage. Tax roll land and state "contracts" refer to land within the limits of association protection paying along with the general property tax. In certain localities the state may let out contracts for defined areas which the association can protect. The term federal government includes O & C land, Clarke-McNary land, the public domain and Forest Service contracts. The expression "county land" and "state land" are self explanatory. The state general control fund indicates money coming through appropriations granted by the legislature. In a somewhat similar manner, the associations maintain a central control fund which may be drawn on in times of emergency, thus reducing the likelihood of excess charges for protection in bad years. "Miscellaneous income" is a designation used to include revenues from various sources such as fighting non-association fires, refunds, interest, accounts receivable, and cooperative protection outside association membership. An attempt is always made to keep the annual assessment on association land down to about 3 or $3\frac{1}{2}\%$ per acre and through the device of the central control fund this is becoming more nearly practicable.

Administrative organization.

It would be tedious to analyze in detail the organization of each of the twelve associations in the state. An explanation of these factors that are characteristic in most of the associations will, however, throw considerable light on their operations.

At the head of the association is usually a Board of Directors elected by the association land members -- who, as a general rule, own about 30% of the land under protection by the association. From the Board of Directors authority passes down in a succession of direct steps to the men actually in the field. For example, the Board chooses one of its members as President of the Board and a Secretary-Manager to administer the business of the association. This Secretary appoints a District Warden for each of the several areas and these Wardens in turn select field operatives to carry out the actual work of protection -- patrolmen, lookouts, fire wardens, and others. It should be pointed out that the Board of Directors of each association is in a position immediately subordinate to two organizations on the same level of importance, namely the Forestry Department and the Oregon Forest Fire Association. The Forestry Department lets contracts for protecting designated areas of land, while the Oregon Forest Fire Association does all necessary lobbying in the state and acts in

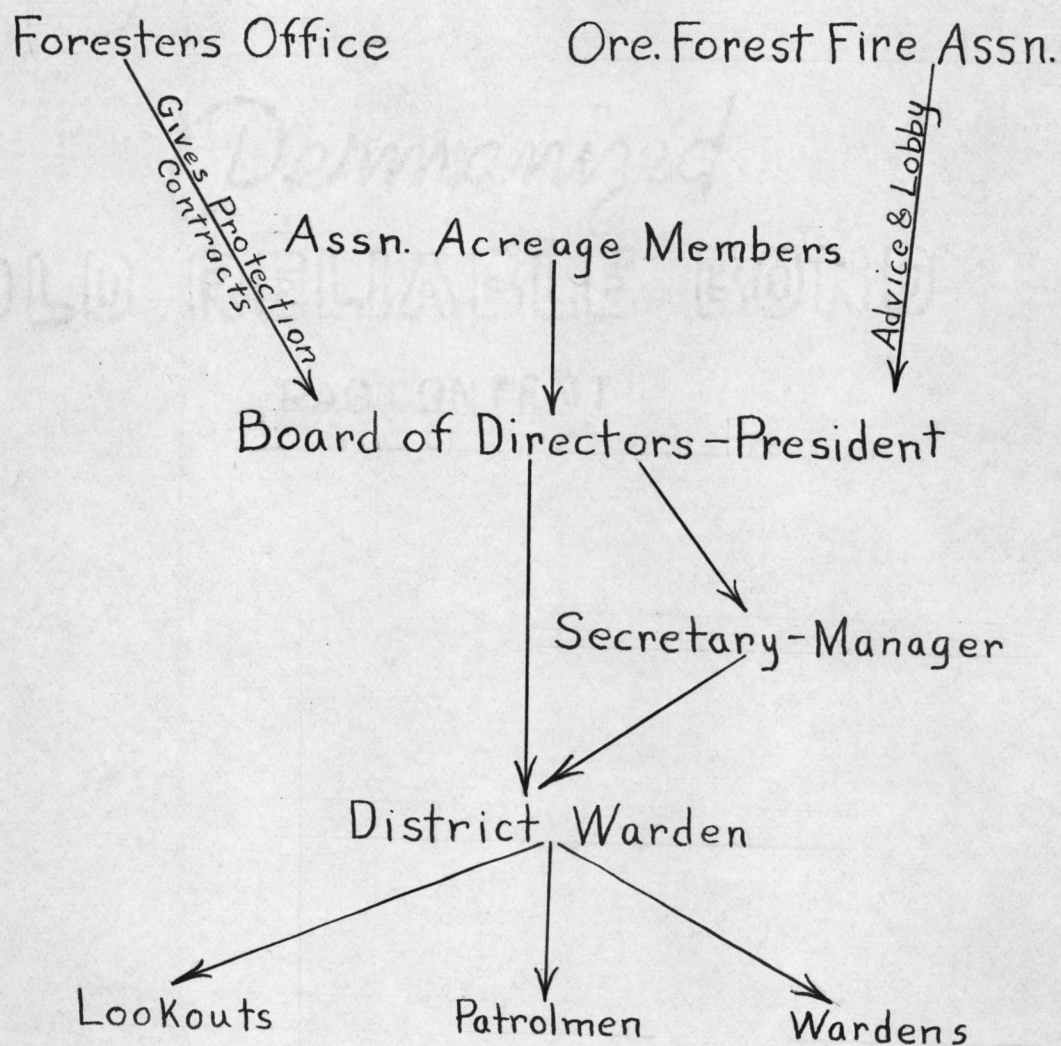
an advisory capacity for the association. The appended diagram should clarify the above description:

Problems and Possible Solutions

In the following pages are presented certain problems of forest protection that today are facing administrative officers, the legislature, and the people. It must be obvious that the best means of solving these problems are subject to a wide divergence of opinion. All that can be said for the solutions offered is that they appear to be the best on the basis of critical research.

In order to avoid confusion the problems selected are divided into problems of law, of administration, of protection, and of financing. Very little space will be given to actual techniques of fire fighting as this phase of the subject is beyond the intended scope of this paper. It should also be borne in mind that present legislation or changes in national conditions might easily force a modification of the methods of solution here advocated.

Association Organization



Law

Clarke-McNary Law.

While the scope of this law is rather broad, the section referring to fire protection is the only part of the act that need come within the limits of the present subject. When the law was put into effect it was only supposed that the state would supply 25% and the federal government another 25% of the cost of protection, leaving 50% to be met by landowners who were supposed to be beneficiaries under the act. With regards to these provisions the law has simply failed to function as it ought to. According to official figures for Oregon in 1938, financing of protection was divided thus: State of Oregon, 25%; federal government 19%; private owners 56%. This would clearly indicate that the state is doing its share toward protection (25%), under the law, but that the federal government has been guilty of a deficit of 6% which had to be carried by the owners in addition to the 50% which was legally their burden. In other words, appropriation by the federal government was in such an amount that their agreed percentage under the law was not met.

As the law stands it is not generally believed that the ratio of rates (25-25-50) could be called equitable when all the facts behind the problems of protection are fairly considered. At the present time it is a matter of record that 90% of man-caused fires are

started by the public or non-land owners either by intent or through some act of carelessness. This being true, it does not seem logical or just for the land owners to be called upon to carry a burden as heavy as 50% -- the rate now in legal effect. Such a burden, whatever the intent, begins to appear as a kind of penalty upon those least guilty under the circumstances, namely the land owners. Nor is guilt or responsibility the only reason why the public should bear a greater share in this cost; the loss also is theirs in no little measure, as witness the Tillamook Fire.

To remedy this indefensible situation the section of the Clarke-McNary law pertaining to fire-protection should be amended in such a way that the federal government may make itself responsible for between 40 and 60 per cent of the cost of state fire protection. This alone would serve to relieve the private land owner from the excess now levied against him; nor would it be going too far to couple with the federal increase an increase of the amount appropriated by the state. These adjustments would not only reduce the indefensible burden on the private owner but would tend to distribute the enormous cost of fires among their chief causative agents, the public.

Fulmer Act.

State forests are a definite need in the state

program for forestry in Oregon as well as in many other states where money is not sufficient to meet the need. While the Fulmer Act does not pertain immediately to fire protection, it has an important bearing on that question. The purpose of the Fulmer Act was to supply federal aid to states in the purchase of land for state forests, but unfortunately, up to the present time, no funds have been forthcoming under the terms of the act to make it effective.

In Oregon there are many acres of potential forest-bearing lands -- a potential source of wealth of which the state has been robbed because of disorganized status of ownership has forced these lands to lie idle. If acquisition of such lands can be financed through the help of federal government, it will represent a decided step forward in the interests of forestry in the state.

Under the Fulmer Act money could be authorized up to a total of \$5,000,000, and if only three quarters of this total were appropriated state forestry would definitely play the important part it should in growing and preserving tree crops for the future.

Land Classification.

The segregation of land according to its best uses is an important phase of any system of land classification. It may be said at once that a good plan of classification of land in Oregon would go far towards solving not only the problem of protection but also

many of the ills in our social system. It is undeniable that many of Oregon's protection problems are directly bound up with the use of land for purposes for which it was never intended to be used, and this regrettable situation can often be traced directly to social conditions or to the action of ill-advised land settlement.

In 1937 a law was passed for the creation of committees on the classification of county forest land. It was enacted that each committee should consist of five persons; one to be appointed by the State Board of Forestry, one by the Director of the state's agricultural experiment station, and three by the county court. Of the latter three it was required that one should be an owner of forest land and one an owner of grazing land. The function of the committee was to make a classification of all lands under one of the three headings: 1. Land used for forest production only. 2. Land valuable jointly for grazing and for forestry. 3. Land suited primarily to grazing. Several counties formed their committees under the law but very little has been accomplished in the actual work of classification, and there are several reasons for this inaction. Probably the main reason for failure to classify lands has been the lack of funds to carry out the work; but two other factors should also be considered: the cost of developing the land, and the

responsibility of individuals with regard to the unpredictable action of fire in clearing land.

There is no essential difficulty however, in overcoming these influences which so seriously retard the application of an excellent measure -- if the problem is approached intelligently. The state forestry office should publicize the need for classification in order to arouse the interest of the public in counties where committees have not been formed and are needed. The state, and to a lesser extent the counties, should appropriate money for the work of classification by these committees; and, when classifications are completed, money should be available for carrying out the development of the land according to the classification determined upon. The forestry department can also play a vital part in development by giving advice and expert assistance wherever these are needed on the program.

The statement can be made confidently that land classification is a factor of primary importance in forestry in the state of Oregon. It may be stated with equal emphasis that until the program of classification of land for certain uses is carried through, other vitally important forestry measures will suffer obstruction. It should be reiterated therefore, that the solution of many forest problems should begin with land classification.

Land acquisition.

Under the present laws in Oregon for the development of state forests, the State Board of Forestry can acquire land through gifts, foreclosures, and purchases. As the law now reads, all delinquent land passes to the possession of the county for whatsoever use the county may deem expedient. Furthermore the county exercises a kind of preemptive right or lien, so that if an owner wished to deed his land to the state he would be required, according to the law, to obtain permission from the county court or from the Board of County Commissioners of the county in which the land was situated. This provision therefore enables the county, if it desires, to prevent the state from obtaining the land.

In the interest of more efficient forestry development several changes might well be made in this statute. There can be little question that the state ought to be empowered to receive gifts of land without the interference of county control. Equally desirable is a clause directing that all forest lands which have reverted to the county through delinquency should be administered by the state forestry department. The designation "forest lands" should refer to lands which have been given this classification by the land classification committees of the counties. All revenue derived from proper administration of this land by the

state should be so distributed that the state would receive equitable compensation for its administrative or other necessary activities on the land, while the county would receive the balance. That such an arrangement would work to the advantage of the county can hardly be doubted. Nearly all county-owned forest lands have been badly managed or not managed at all simply because the counties have had neither funds for development nor men trained in the work of forest management. Delinquency has added to the confusion. As a county became more heavily burdened with delinquent land its problem of managing these lands grew all the harder because its revenues through taxes were reduced. If, on the other hand, county forest lands were managed by the state forestry department the county would suffer no loss but would find itself in a position to make positive gains by such an arrangement.

If the lands in question were properly managed and cared for, the loss from fire would inevitably be reduced. Much delinquent property is "cut-over" land and it is on such terrain that the lack of fire protection is most serious. Generally speaking, the county feels unable to pay the cost of protection and the association is not enthusiastic about protecting such land, unless it offers some actual hazard to areas carrying the protection costs. Therefore, legislation as that suggested above can aid in solving

this problem that is now confronting county land administrators.

Administration

Civil Service.

In spite of all that has been done to create a Civil Service in the various states of the Union, many public offices both in local and in state government are still the prey of the age-old Spoils System. Four years is commonly the length of term for offices upon which most state positions are dependent. It does not need any expert knowledge of highly technical subject, such as forestry, to see clearly that a change of personnel every four years is fatal to successful management -- especially when the change is made on the basis of party affiliation rather than for efficiency in getting the job done properly. It would be safe to hazard a guess that any department of government will suffer in greater or less degree under the spoils system. Politics and fire administration do not mix well; this fact is common knowledge. If efficiency is to be looked for, then appointment to office for service to the political party instead of for professional capability must be forever eliminated.

A civil service board should be set up with the power to rate the personnel in various positions and to establish qualifications for different posts in the department. The positions determined upon should then

be filled by competitive examinations carefully prepared with relation to the job and given under conditions of strict equality and fairness. If such tests were wisely framed and honestly conducted they could hardly fail to select the best men for the job and would enhance the spirit of justice and fair play -- not to mention that feeling for team work which is so essential in the cooperative work of forestry.

A new feeling of job security would replace the constant fear of dismissal through political affiliation and the entire morale of field groups would be heightened. It is well known that employment under a capability and merit system, especially among seasonal workers, tends to create a definite psychological reaction -- a feeling of superiority because the position was earned and not merely awarded -- and, in consequence, a more dependable worker. Men guilty of incompetence, neglect, and disloyalty would slowly but inevitably be eliminated from forestry staffs so that the personnel would finally represent a very high type of public servant. Nor are these results a Dead Sea fruit of mere idealism; they have been observable wherever Civil Service has been given a fair chance to prove its superiority over the system of party appointment. All personnel below the grade of state forester should be subject to Civil Service regulations: Assistant State Foresters, technicians, District Fire Wardens,

inspectors, patrolmen and others, including "seasonal" employees whose term of employment is normally three months. The latter would then be sure of seasonal work each year, provided of course, that their work were satisfactory.

The strongest objection to the Civil Service Plan has been that it implies an increase of expense to the state and to the taxpayers in creating a Civil Service Commission. The argument is not without a degree of truth, but if the newly created Commission were designed to include other departments of the state government it would be made to pay for itself not only in more widely apportioned fees but, in the long run, in the heightened efficiency of state enterprises. The Civil Service idea is not new; its merits have been fully demonstrated; other states have benefitted by it; it is a truly democratic method of proceeding, and it should be incorporated into the political and social structure of the great state of Oregon.

Board of Forestry.

The State Board of Forestry of Oregon is unique by reason of the varied interests in the state which its members represent. On the Board are men who represent, not forestry only, but livestock and grazing interests, others whose time is devoted entirely to the Forest Service, lumbermen, members of the fire associations, and representatives of the School of

the Forestry School. As now organized, the Board has nine members including two ex-officio members, the Governor and the representative of the School of Forestry. The seven appointive members of the Board have no definite term of office, except that the Governor can appoint new members to fill vacancies due to death, resignation or substitution of a new member for one whom the Governor (at his discretion) believes to be incompetent. It should not be thought that the function of this Board is unimportant. Its authority to shape policies and to regulate the multifarious activities invoked in carrying out those policies endows it with no little power and influence. Tenure of office on the Board of Forestry is therefore a matter of great concern to all those who are interested in the welfare of the state.

In other states, most boards of a similar nature and function either use a system of rotation of members in some reasonable way. Such restriction promotes a healthy condition in government by preventing dominant control by any single group for an unlimited time. Moreover, it is highly desirable that a board exercising practical control of important functions should be constantly renewed, if it were only to infuse into the body new ideas and to replenish its energy and prevent a well-known tendency to "go stale." Under existing rules in Oregon, a man might remain as a

member of the Board for life. Meanwhile a tendency toward stagnation cannot be denied.

A commendable plan for the State Board of Forestry would include rules for rotation of membership over such a period that a new member would take office every eighteen months. The state would still profit by the superior ability of experts on the Board since the term of board members would be ten years and six months. Executive control of the Board would be prevented because the Governor, during his four year term, would be able to appoint only three members of the Board and thus a hand-picked majority would be impossible. The charge has been made that at present the Board of Forestry has tended to grow into a static organization, fatal to the live issues of forestry that are rising with ever increasing frequency. The changes in tenure of office on the Board as outlined above would create a dynamic Board of far greater effectiveness in promoting one of Oregon's greatest industries.

Field Administration.

Organization outside of Salem at the present time is confined, for the most part, to two localities: Southwest Oregon and Northeast Oregon. The remaining Oregon land under private ownership is protected by various associations and, considering the limitation of their funds, the associations have done a good job

in most cases. Some of the associations are badly handicapped because so much of the land they are protecting is delinquent and unable to contribute anything towards protection. This is particularly true of cut-over lands and young stands of second growth. Generally speaking, these lands cannot afford to pay for protection and, unless it directly affects old growth timber, the cut-over land receives little or no protection. To anyone not familiar with forestry, these areas of young growth might well seem of minor importance, but such is by no means the case; they commonly represent future merchantable stands of high potential value. If, for example, these areas are burnt over, the production of merchantable timber receives a definite setback. With such limited financial resources it is quite natural (and at present defensible as good business), for the association to protect only mature timber; but this preservation of the timber of immediate value is merely an unfortunate alternative to insufficient protection for the entire land, and in the long run future generations will suffer if in our time protection is limited to selected areas. The obligation rests upon our shoulders of protecting the entire future timber crop. This immediately implies far-sighted, long range planning for the future -- a type of planning that properly belongs to government since government alone can bear the burden of such a

protracted program. We can hear the cry of the ultra-conservative: "The associations were good enough for our grand-daddies and they're good enough for us." The simple fact is that the associations were never "good enough" except in the purely relative sense of the best that could be done under the circumstances. When fire protection began in Oregon, the associations were the best step that could be taken at that time, and no one would care to minimize the enormous service they have rendered the people of the state; but conditions have changed during the intervening years and there can be no question that fire protection of private land must become entirely efficient, which means that it must become a function of the state.

There are incidental reasons why protection should be under the jurisdiction of the central authority of the state. For example, what is to be done when a fire breaks out near the boundary of an area under private protection? Could anything be more ludicrous -- if it did not involve such tragic losses -- than the hurried attempt, while the fire burns, to determine who shall be responsible for suppressing the blaze? Forest fires might well have been included with time and tide in waiting for no man. Oregon forest fires, especially those that rage in western Oregon, are not slower than others, and the delay incident to wrangling over whose fire it is has confessedly resulted in fires of far

greater range than was necessary. Quick hitting of all fires, wherever they happen to break out, can be guaranteed only when the entire fire area is under the protection of a single agency, the state. Furthermore, the question of responsibility would not then have to be shifted from shoulder to shoulder; it would rest squarely on the state and its agencies.

Another undesirable characteristic of the association system is the method under which membership in the associations is regulated. In too great a number of the associations the membership comprises only from 30% to 50% of the owners actually protected. This means that many landowners who are not members, although they pay the protection fees along with the property tax, have no voice whatever in shaping the policy of the association. Whatever the result of such a condition may be in other organizations, in the matter of fire-protection it is anything but healthy. Just as the taxpayers in a city have something to say about the constitution and administration of their police and fire departments, so should the owners of forest lands be able to make his due influence felt in questions of fire protection pertaining to those lands.

It is not always easy, however, to solve this kind of difficulty by mutual agreement among owners; and, even when the difficulty has been solved by agreement, it is still difficult at times to apply the terms of

the agreement harmoniously to actual conditions. The most feasible recommendation is to vest the right and duty of protecting private lands in Oregon directly in the state. Forest crops have a national importance far greater than the local interest of those who own the forests; hence all of the people are concerned with adequate protection -- both of present and future stands of timber. Can any better indication be offered that the state is the normal agency for fire protection? For the state alone can fully carry out the will of the people.

Protection

Personnel.

So strong are the arguments in favor of state direction of fire protection, that it is generally believed that state control lies in the near future. Nevertheless, when the State of Oregon takes over the protection of our mighty forest lands, there will be many "die-hards" alert to pick flaws in the state administration and to criticize severely any lapses in state management. It therefore behooves the proponents of state protection to demand that the state be provided with trained personnel fully competent to perform their duties. With this precaution, the criticism that must be expected can have only a constructive result.

Another essential to success under state authority is careful and intelligent division of the state into

ranger districts, each district to have at its head a ranger and a staff of assistants, wardens, and the like. The rangers should under no circumstances be mere political appointees. All should be men with technical training, that is to say, graduates of recognized forestry schools or able to show an equivalent in administrative and technical experience. The ranger would be a year-round man, but his services would not be wasted in the off season; his training would enable him to perform other duties in addition to the work of fire protection. For example, he might, during the winter months, act as promoter and agent in the sale of timber in state forests; he might also help loggers to burn their slash, teaching them correct and safe methods; he could plan facilities for recreation; he could maintain fire protection equipment and add whatever might be advisable and, in general, he could carry on all these activities that are included in the term "forestry work." Very little foresight is needed to visualize how much state forestry will include in the future, in addition to the mere fighting of fires; and how the personnel of those coming times will need a much broader training than the fire-fighters of today.

What is true of the abilities of rangers and wardens should be equally true of their subordinates, within the scope of their duties. These assistants (patrolmen,

lookouts, fire-chasers, etc.), should also be experienced or specially trained and able to qualify under Civil Service regulations pertaining to them.

Probably more important than the classifications of staff mentioned above are inspectors and law enforcement officers. As fire protection is administered in Oregon at present, the corps of inspectors is not nearly large enough. The crying need for increasing their number is well illustrated in the logging industry. In that industry it is practically impossible today to make inspection calls often enough. In the hurly-burly of actual operations for profit, it is easy to understand that carelessness will tend to increase, and for this the operators must not be too harshly censured for their whole time and attentions will naturally be given to the job. If however, a closer watch could be maintained on logging operations, crews would develop habits of carefulness that would avoid many serious fires. The advisability of frequent, periodic inspections cannot be denied. Hardly less essential are trained law enforcement officers -- especially in regions where incendiarism has been frequent. Such officers ought to have the best available training and should be experienced in the art of gathering evidence -- two factors that, in the opinion of some experts, would quickly round up the firebugs and tend to put an end to much forest arson. Obviously this kind of

policing and expert investigation cannot properly be included among the duties of the ranger or his assistants, therefore officers of law enforcement should be under the immediate direction of the head office at Salem, with provisions for full cooperation in field work between the officer, the ranger, and the ranger's staff.

Training.

The members of the fire protection service should have ample training for their duties. In view of the importance of the work they do, such a statement is a truism. Persons not familiar with fire fighting and other forest techniques might be prone to imagine that fighting a forest fire is simply a matter of tremendous effort coupled with common sense. This is not true in any fair sense of those words. Methods have been studied and developed over a period of years, and before a crew goes out into the field it should be well acquainted with what has been learned in this difficult and dangerous art. A school, modeled after the Forest Service schools, should be organized to train all rangers and assistants during the winter time. The program and length of course could be determined once the school had been opened. Fire fighting problems, coordination of effort, team work, instrumentalities of all kinds -- these elements of fire protection could be studied thoroughly in the quiet of class rooms; and

there can be no doubt that the beneficial effect of such courses would soon appear in smoother working organizations under the stress of actual fire conditions.

In order to keep the proficiency of seasonal workers up to par, they also should go through a period of training. One week before each fire season, these workers could take instruction similar to that given to fire guards in the national forests. Such training, although it is not extended, would so correlate with the special training of rangers and their staffs that top efficiency should be forthcoming from all workers. It need hardly be pointed out that this increased efficiency and coordination would result in an immense saving to the state, especially in fire losses.

Crews.

Specially trained crews are a new departure in recent years, for fighting forest fires. They have been organized by the Forest Service and only last year by the Forestry School at Oregon State College for the more rapid suppression of fires. A crew, in this particular sense, consists of a group of men well trained in fire fighting and specially organized to get to the scene of a fire before it has time to spread and intensify. The crews developed by the Forest Service consist of forty men subject to call in any part of Region Six. Their work has already attracted

the notice of more than one expert in fire suppression through their efficient methods of getting the fire under control before they "blow-up". In the summer of 1940 a similar crew had its station near Corvallis. Like the Region Six crew, this group was also trained in all the arts of fire fighting, but it was subject to call for any fire in the state of Oregon.

These professionally trained crews offer a most valuable expedient to the state for fire protection. A large part of the difficulty in fire suppression at the present time is the delay experienced in rushing sufficient forces to the scene of the fire, a factor that can be measured by a vast increase of acreage destroyed. To the proposal that crews be recruited from the streets of towns and from the countryside it can be answered that such forces cannot properly be called crews; they are mere mobs of assistants who, however well-intentioned cannot be compared with trained and efficient fire fighters. Experience, notably in California, has amply proved that the small, highly trained and experienced crews, ready for immediate service and drilled in team cooperation, were incomparably superior to momentary recruits. Money and acreage saved have clinched the argument in favor of small crews. Small, but thoroughly organized crews of the Forestry School type should therefore be established at strategic points in each ranger district.

They would not have to lie idle while waiting for a fire to break out; they could be made useful in building roads and structures needed in their vicinity, and under proper management, their expense as fire fighters could be paid off largely by their services in other directions. Such well organized crews would hit fires fast and keep burned-over acreage to a much lower minimum than prevails at the present time.

Finances

To carry out in its entirety a program of the kind outlined in the preceding pages would unquestionably call for a larger amount of money than has theretofore been forthcoming for fire protection in Oregon. In point of fact, a program for maintenance should "provide strong, flexible financial support." (20) The word flexible has been used advisedly because the support must be steady and continuous during bad fire seasons as well as during those that are light and least burdensome. As with the other major factors of protection, so here, it becomes obvious at once that the state is the most normal source of flexible support. While a few private owners might conceivably meet the problem of support adequately, owners as a whole group cannot be expected to offer support constantly, sufficiently, and flexibly.

It would be impossible to prove that the present method of financing fire protection is equitable and

efficient. If one remembers the predominant source of fires, he is driven to the conclusion that the private owner is providing far in excess of his share for protection. Certain timber owners in one part of the state must pay higher rates under association arrangements than owners in another part, although they do not receive any better protection for the additional cost. One reason for this inequality is an excess of non-paying land. Under state control of protection however, the tax on acreage would be done away with and the cost of approximately 75% of fire protection would be met by state and federal legislative appropriation, thus reducing the burden on each timber owner to 25% or less of the cost of protection. Any citizen of the state of Oregon who might complain that this represents a levy upon for the preservation of resources owned by private capitalists, should be asked to picture the economic disaster that would overtake his beloved state if her forests were ever ruined, in whole or in part. There is not a citizen of this commonwealth, however remote and obscure, that would not soon feel such a vital loss. The forests of Oregon are an enormous natural resource and their preservation is a duty of every citizen and resident in the state. It would be an utter absurdity to rank this obligation below that of maintaining national defense, or a police or fire department; and yet the taxpayer needs no argument to

persuade him of the necessity of those agencies. Could anyone be found willing to go back to the days of volunteer fire departments? Is there any important community in which police protection is left in the hands of a private organization, to be measured out according to the size of a fee?

The problems presented by forest control and protection are numerous and intricate; only their major outlines have been sketched here. There is a growing tendency that the state and the federal government should work hand in hand to acquire state forests and to carry on important research work in fire problems. Through the Fulmer Act funds for acquisition of state forests can be handled, and through the McSweeney-McNary Bill fire research can be carried on with federal aid. Additional study is demanded in such important fields as fire behavior, fire protection planning, tools and equipment, meteorology and its effect on fire behavior, reduction of fire hazard on logging operations, nature and extent of fire damage, and in a host of other departments of forest protection.

It would be more than expedient to establish a fund for emergencies, so that ever conceivable crisis would be overcome without straining the normal financing system. Furthermore, any plan of financing that the state adopts should be capable of expanding to care for every reasonable future contingency. In short,

fire protection of Oregon forests must be adequate, both now and in the future; it must be planned; it must be in the hands of experts and beyond the possibility of bungling; it must be directed under a permanent, wise and expanding policy, and finally, it must be implemented with funds that are both ample and dependable.

Conclusion

The people of Oregon are coming to realize more and more the tremendous influence of their forests on the economy of their home state. It is well recognized that the center of the lumber industry of the Northwest is slowly moving southwards from Washington into Oregon, and now is the time to take wise counsel in order that this growing industry may find a permanent home in our midst. The great prerequisite to the success of forest enterprises is to keep the forests in a state of production at all times with as little loss from fire as possible. But to accomplish this desirable end further and more advanced legislation is needed and the purpose of this paper has been to show what the character of such legislation should be. One fact should stand out with the emphasis of a challenge: No matter how great the differences of opinion on these momentous questions, the questions themselves demand an honest solution if Oregon is one day to reap the profits of those magnificent forest resources with which her Creator has endowed her.

BIBLIOGRAPHY

1. Brown, N.C. General Introduction to Forestry in United States.
2. California Conservationist. Classification and Wages. August 1938, page 17.
3. California Conservationist. Division of Forestry New Laws. Jan. 1939, page 9.
Feb. 1939, page 13.
4. California Conservationist. Needs of Fire Prevention Education. April 1939, page 16.
5. Cronemiller, Lynn F. State Forestry in Oregon. Thesis for Degree of Forest Eng. June 1936.
6. Department of Forestry, State of Oregon. Fire Wardens Handbook, 1939.
7. Department of Forestry, State of Oregon. Annual Reports of the State Forester.
8. District Wardens Report of Eastern Lane County Fire Patrol Association. Dec. 31, 1939.
9. Eberly, H.J. Oregon Reforestation Tax Law. Jour. For. 29:83. Jan. 1931.
10. Editorial. New York Increases Its Lead in State Forestry. Jour. For. 30:1. Jan. 1932.
11. Editorial. Who Should Own Timber. Jour. For. 31:127. Feb. 1933.
12. Editorial. Politics versus Efficiency in Government Jour. For 32:521. May 1934.

13. Editorial. Cooperative Forest Protection: Can It
Succeed. Jour. For. 36:1097. Nov. 1938.
14. Ferguson, J.W. Land Use and Fire Protection In
Southwest Oregon. Jour. For. 35:536.
June 1937.
15. Hawes, Austin F. State Forests and the Unemploy-
ment Problem. Jour. For. 29:1191.
Dec. 1931.
16. Hoffman, Bruce E. Problems of Private Forestry In
the Douglas Fir Region (Charles Lathrop
Pack Forestry Foundation).
17. Horning W.H. The O & C Lands: Their Role In Forest
Conservation. Jour. For. 38:379. May 1940.
18. Illick, J.S. Administrative Setups for State
Forestry. Jour. For. 35:539. June 1937.
19. Markwell, Katherine. Recent State Laws In Forestry.
Jour. For. 36:300. March 1938.
20. Matthews, D.N. Forest Fire Control In Western
Snohomish County, Washington. U.S.D.A.
Forest Service, Pacific Northwest Forest
Range Experiment Station, Portland, Ore.
21. Metcalf, Woodbridge. Tank Trucks For Rural and Forest
Fire Fighting. Jour. For. 31:522.
May 1933.
22. Morrell, Fred. Forest Fire Protection - A National
Interest. Jour. For. 29:724. May 1931.

23. Morrell, Fred. Some Financial Aspects of Cooperative Forest Protection. Jour. For. 30:301.
March 1932.
24. Morrell, Fred. The 25-25-50 Ratio In Financing Fire Protection. Jour. For. 29:520.
April 1931.
25. Oregon State Board of Forestry. Explanation and Text of Reforestation Laws of the State of Oregon. Revised 1931.
26. Oregon State Planning Board. Oregon's Forest Problems. April 25, 1936.
27. Oregon State Planning Council. Report of the Protection Committee, Nov. 9, 1934.
28. Pratt, M.B. The California Forest Service Its Growth and Its Organization. Jour. For. 29:497. April 1931.
29. Price, J.H. The Clark-McNary Act and Federal Responsibility In California's State Forestry Program. Jour. For. 29:731.
May 1931.
30. Sanford, Burnett. Some Preliminary Studies Toward the Development of a State Forest Fire Protection Policy. Jour. For. 30:616.
May 1932.
31. Seventeenth and Eighteenth Annual Report of Priest Lake Timber Protective Association.

32. Southern Idaho Timber Protective Association.
The 1931 Forest Fires.
33. Staley, Lewis E. Conservation and Land Use In
State Forestry. Jour. For. 31:265.
March 1933.
34. State Cooperative Board of Forestry. Forest Laws
of the State of Idaho.
35. Tracy, C.H. Forest Fire Protection In Southern
Portion of West Virginia. Jour. For.
30:58. Jan. 1932.
36. Twenty-Ninth and Thirtieth Annual Report of Coos
County Fire Patrol Association.
37. Twenty-Sixth and Twenty-Eighth Annual Report of
Douglas County Fire Patrol Association.
38. U.S. Forest Service. Forest Facts and Statistics
For the North Pacific Region.
39. Wilson, F.G. Wisconsin's County Forest Program.
Jour. For. 30:155. Feb. 1932.
40. Woods, J.B. Moves On Oregon Checkerboard. Amer.
For. 36:451. Oct. 1940.