

**STATE OF OREGON**

**Tenth Annual Report**

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OF THE

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**STATE FORESTER**

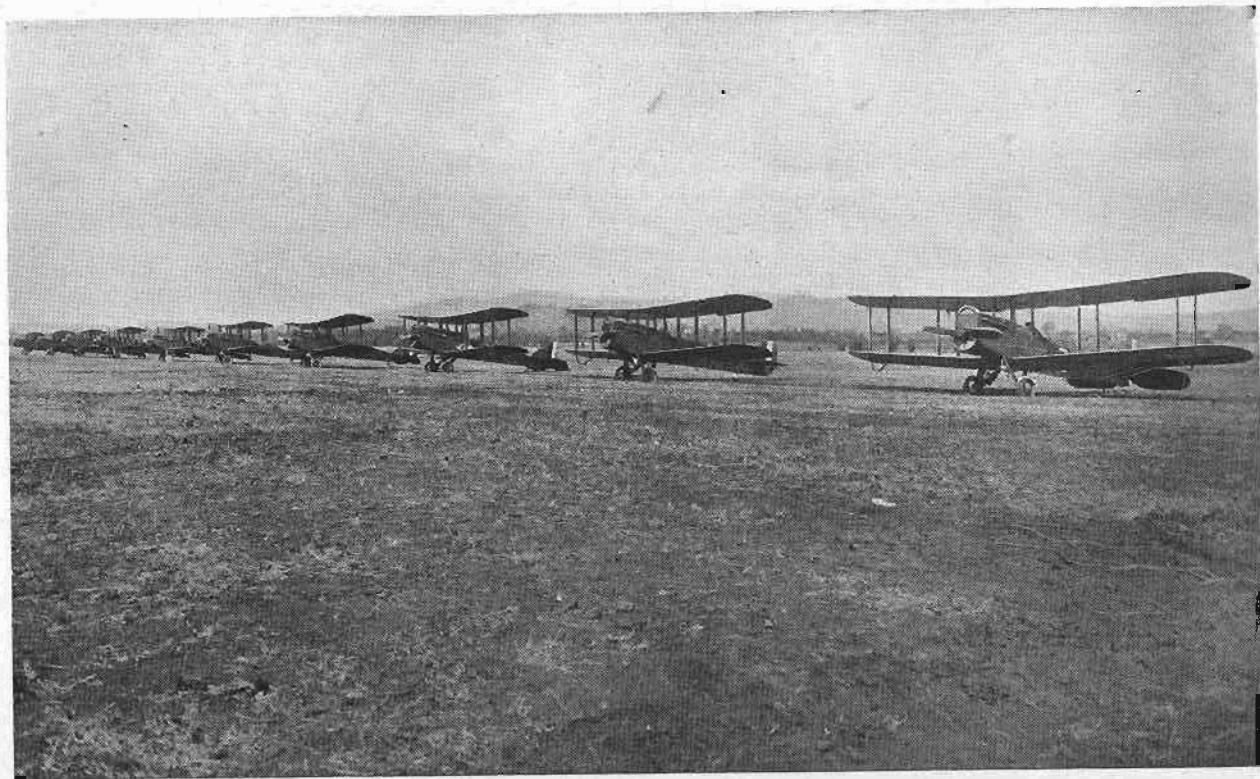
TO THE

**GOVERNOR**

FOR THE YEAR ENDING

**December 31**

**1920**



LINEUP OF FOREST PATROL PLANES AT EUGENE BASE

STATE OF OREGON

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## LETTER OF TRANSMITTAL

Oregon State Board of Forestry,  
Salem, Oregon, January 1, 1921.

His Excellency, Ben W. Olcott,  
Governor of Oregon.

Sir: In compliance with the provisions of Section 8953, Oregon Laws, I have the honor to transmit the Tenth Annual Report of the State Forester of Oregon.

I desire to mention as especially contributing to the preparation of this report, members of the State Board of Forestry, United States Forest Service, Western Forestry and Conservation Association and the secretaries of local fire patrol associations, and to express my appreciation for their courtesy and helpful cooperation.

Very respectfully,

F. A. ELLIOTT,  
State Forester.

## OREGON STATE BOARD OF FORESTRY

GOVERNOR BEN W. OLCOTT, Chairman.....	Salem
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## REPORT OF THE STATE FORESTER

### INTRODUCTION

Since 1920 marks the tenth anniversary of forest protection under direction of the Oregon State Board of Forestry, a summary follows of such outstanding features as have been developed during the past decade.

The state legislature of 1911 created a non-political Board of Forestry and gave Oregon her first set of really constructive forest fire laws. In 1913, the compulsory forest patrol law was enacted. No other state in the Union had such a law at that time and Washington is the only other state to have similar legislation at present, although other states will endeavor to pass compulsory patrol laws at their coming legislatures. Since 1913, additional strengthening amendments have been added to the Oregon law, until today this state stands forth with a nearly model set of forest fire laws. The past ten years have clearly demonstrated the justice and practicability of the law and the consensus of opinion is that it is an extremely good one. Probably in no other state in the Union will be found better cooperation between all forest interests than exists today in Oregon.

The non-political organization and the compulsory patrol features of the law are its outstanding features. A State Forester is charged with the execution and enforcement of the forest fire laws on all forest lands under state jurisdiction. This area amounts to approximately 11,500,000 acres of timber, logged-over, burned and brush lands constituting a fire menace.

The prevention of forest destruction by fire has been and will continue to be the principal function of this office. To attain this object, the heartiest cooperation is maintained with the Federal Forest Service and with the timbermen themselves, since all parties are equally interested. An effective organization has been built up in Oregon for the detection and suppression of forest fires.

As previously stated, the State Forester supervises the protection of approximately 11,500,000 acres in Oregon; in other words, all timber and other land constituting a fire menace lying outside the national forest, Indian reservation and national park boundaries.

The state legislature provides the Board of Forestry with funds for the enforcement of the patrol law and for the supervision of the protective work, but all patrol, improvement and fire fighting expenditures are paid by the timber owners in accordance with the compulsory patrol law.

During the period of fire hazard, the state furnishes the timbered counties with from twenty-five to thirty district fire wardens. These men act as field representatives of the State Forester and have charge of fire prevention, suppression and fire law enforcement within their respective districts.

Since the inauguration of the present law, the effectiveness of forest protection has been increased in many ways. An effective lookout system has been established and a total of 99 lookout-towers, tool-boxes and cabins have been built during the past decade. In the endeavor to improve the fire plan and to decrease the elapse of time between the

discovery and the report of fires, 843 miles of telephone line have been constructed and 2,883 miles repaired. A total of 1,559 miles of new trail have been built and 12,778 miles of old trail brushed out, all of which enables patrolmen and fire fighters to decrease the elapsed time between the report of a fire and action for its suppression. The timbermen, through their local associations and through the State Forester, have purchased tools, equipment and means of transportation for fire fighting.

The Oregon Forest Fire Association has acted as a clearing-house for the fire patrol associations and its officers have been most actively engaged in the work of their organization. The state, in connection with the compulsory patrol law, has fostered the original associations and helped in forming thirteen new ones.

Wardens have assisted loggers and settlers in the burning of dangerous slashings. A total of 217,155 acres have been so disposed of to date.

It has been possible to give limited assistance to Southern Oregon patrol associations in their endeavor to control pine beetle infestations.

The one protective feature, that has attracted more notice and been given more publicity than any other, has been the airplane patrol. Nation-wide attention has been given this new and original idea. The War Department has cooperated with the State and Federal Forest Services in providing five airplanes and operating personnel in 1919 and eleven planes in 1920. The only other state to receive this assistance was California.

In connection with the advent of the patrol planes, at least thirteen landing fields have been established. Forest patrol planes were the inducement for this endeavor. Several of these fields are municipal. Substantial markers were constructed last season on state lookouts for the purpose of assisting observers and pilots on airplane patrol in checking their locations and in locating fires.

In cooperation with the Federal Forest Service, a total of 147 convictions have been secured and \$1,322.15 collected in fines for state and federal fire law violations.

Logging operators are cooperating by complying with the law in equipping their logging engines and donkeys with adequate spark-arresters and fire-box screens.

Fire notices have been printed and posted in the timbered regions. Various designs of posters have been used, but the object of them all has been to caution the visitors and users of the forests against the danger of fire, and to secure their cooperation and personal interest in keeping the forests green.

The necessity of forest protection has been brought before the public in many other ways and even more such work is necessary. State forest officers have delivered illustrated lectures before public schools and commercial organizations. Forestry exhibits have been arranged at state and county fairs. In 1920, Oregon participated in a "Forest Protection Week." Addresses were delivered before civic organizations and the newspapers devoted a large amount of space to the need of keeping fire from the forests. The clergy mentioned the necessity of forest protection in their sermons and the school children had the subject brought to them from several angles. Under direction of the Western



Forestry & Conservation Association, the timbermen held a slogan contest for school children and offered prizes for the best slogan on forest protection. Out of the eleven hundred and fifty replies received, the following was awarded first prize:

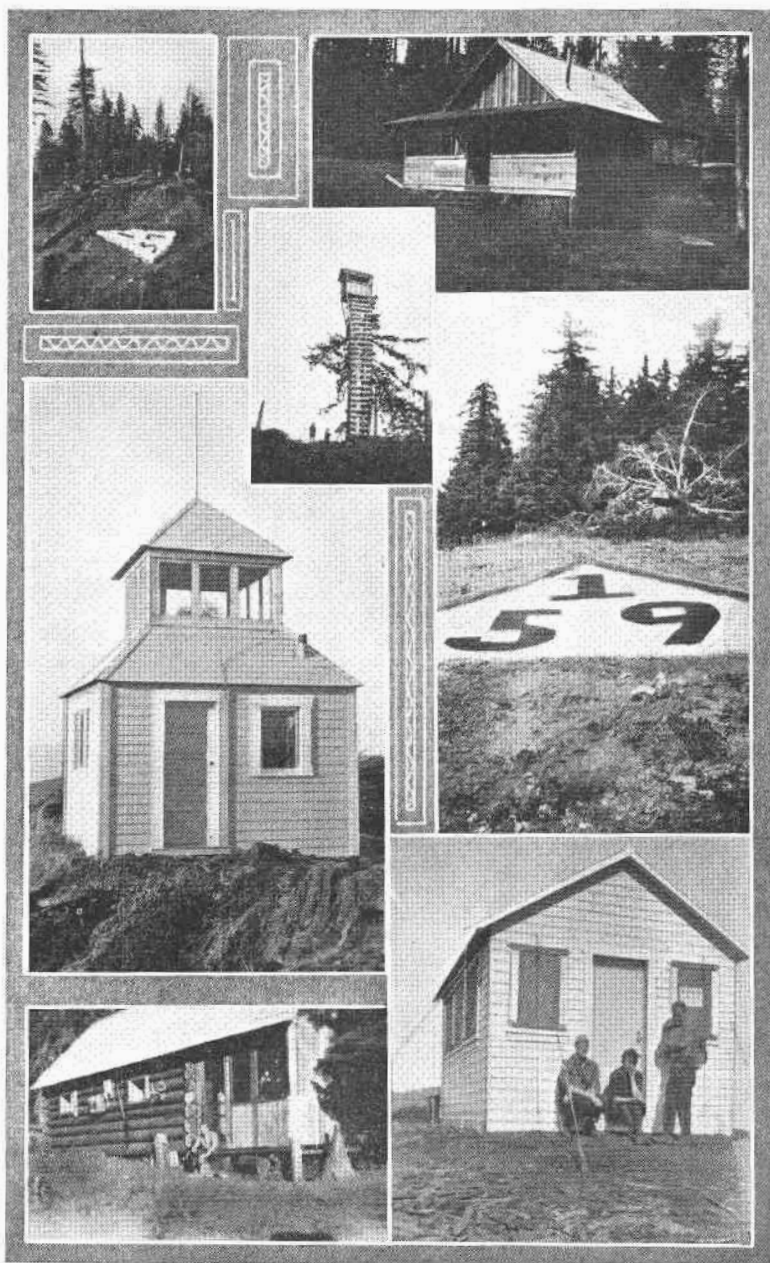
"Lumber, fuel, beauty, joy—  
Forests furnish, fires destroy."

Another highly important and far-reaching feature is the adoption by the Board of Forestry of a state forest policy. This policy was adopted in 1920, and is in line with the new national forest policy advanced by Mr. Graves and the Forester, Mr. Greeley. This new state policy is published in full in another chapter of this report.

A complete and up-to-date plat book and card index record has been compiled, showing the ownership, acreage and status of all timberland within the state. This ownership list comprises some 17,580 names and is used continuously in connection with the administration of the compulsory patrol law.

A forest cover map of Oregon has been compiled and published and is on sale throughout the state. Besides showing all topographical features, this map shows in colors the character of the forest cover over the entire state.

Action has already been taken by the federal and state authorities for the exchange of scattering school lands lying inside the national forests for a compact block of government timberland. This will give Oregon a state forest of approximately fifty thousand acres. It is expected that this exchange will be consummated within the near future.



TYPES OF CABIN, LOOKOUT AND AIRPLANE MARKER CONSTRUCTION  
IN 1920

## STATE FIRE WARDENS

TABLE NO. 1

County	Employed by individual timber owners	Employed by associations	Employed by state under Weeks law	Employed by Forest Service	Employed by timber own- ers, state supervision	Serving without compensation	Employed by the state	Total
Baker .....		2	1			5	1	9
Benton and Lane .....	4	10	4	12	1	2	2	35
Crook, Deschutes and Jefferson .....	3		2	14		3	1	23
Clackamas and Marion ..	1	5	3	2			1	12
Clatsop .....	5	12	1				1	19
Columbia and Washington .....	18	18	1			1	2	40
Coos .....		18	3			5	2	28
Curry .....	1			5	3		1	10
Douglas .....	4	19	4	1			1	29
Grant, Morrow, Uma- tilla and Wheeler .....	1			2	6		1	15
Hood River and Wasco ..	1					1		2
Jackson .....	3		2	8	11	2	1	27
Josephine .....			2	9	8	2	1	22
Klamath and Lake .....	1	8	1	5		5	1	21
Lincoln .....		4	1	2			1	8
Linn .....	7	19	2	5		1	1	35
Multnomah .....	3					8		11
Polk .....	2	5	1			6	1	15
Tillamook and Yamhill ..	6	20	1	1			2	30
Union .....		2	1	1			1	5
Wallowa .....	2	2	1	7			1	13
Total .....	62	144	31	74	29	46	23	409

In addition to the fire wardens listed above, one warden was employed by Tillamook county; one man given a voluntary appointment to serve at large; and thirteen men were employed by the Spruce Production Division of the United States Army to work in Clatsop, Lincoln and Tillamook counties.

## EXPENDITURES

A total of \$256,843.31 was spent in 1920 for the protection of timberlands outside the national forest boundaries. Of this amount \$172,412.89 was spent for protection and improvement work and \$84,430.42 for fire fighting. Of the total amount expended for patrol and improvement work, 82½ per cent was paid by the timber owners under the patrol law and by the O. & C. allotment, 9 per cent by the state, 4½ per cent from funds provided Oregon under Weeks law, and 4 per cent by the Spruce Production Corporation. In no state in the Union are the timber owners doing more towards protection than in Oregon.

A complete statement of expenditures for patrol, lookout and improvement work will be found in Table No. 2. These funds were provided by the state, timber owners and also by three federal allotments

under the Weeks law, Spruce Production Corporation and the O. & C. Railroad grant land agreement. Although the expenditure of \$172,412.89 is principally that of salaries for patrol and lookout work, it also includes the patrolmen's time in labor on trail, telephone and other improvement work. A few associations maintained regular improvement crews, but a large percentage of this work was accomplished during periods when weather conditions made patrol and lookout work unnecessary.

The state policy has been to encourage the local fire patrol organizations in the building of trails and telephone lines and to stimulate a greater interest in the organization of plans to insure the greatest protection of timberland.

The majority of the timber owners now fully appreciate the necessity of trails, lookout-towers, cabins, and of telephone lines.

The campaign in Oregon since the enactment of the compulsory patrol law, has resulted in effective plans of protection being put into operation throughout the state. More trails, more telephone lines and more cabins and lookout-towers are needed and will be built in time, but the high cost of labor and material has curtailed many new projects during the last few years.

Instead, more attention has been devoted to the maintenance and upkeep of improvements already constructed. Last season over 146 miles of new trail were built and 1,962 miles of old trail brushed out. There were 111 miles of new telephone line built and 749.5 miles repaired; also twenty lookout-towers and cabins were constructed.

The total cost of this work amounted to \$36,324.17 in labor and material.

Due to curtailment of improvement work during the past three years, a large amount of such work is now needed and the total costs in several counties are as great this season as for 1919, but costs for the state as a whole are far less, as no large fire fighting bills were incurred.

Table No. 3 gives complete information relative to the cost and character of all improvement work as accomplished by the timber owners. No money is expendable from the state appropriation for this work other than supervision; therefore, the total expense was borne by the timber owners and by the federal government through allotments.

Annual expenditures for patrol and fire fighting by the timber owners of the state, acting under the patrol law, have, during the past four years, more than doubled over the 1913-1916 period. This increase does not indicate a greatly increased patrol force, nor extremely disastrous fire seasons, but it does indicate that prices for labor, equipment and supplies have raised and that the price of fire protection has gone up.

## EXPENDITURES PATROL AND IMPROVEMENT WORK, 1920

TABLE NO. 2

County	Timber Owners			State patrol	Federal under Weeks law	Total
	Individual patrol	Association patrol	Patrol under direct state supervision			
Baker .....	\$ .....	\$ 1,025.43	\$ .....	\$ 711.81	\$ 227.73	\$ 1,964.97
Clackamas and Marion .....	.....	8,599.94	.....	913.20	772.00	10,285.14
Clatsop .....	1,034.95	14,746.02	.....	888.80	244.00	16,913.81
Columbia and Washington .....	821.65	11,600.82	.....	1,500.11	270.83	14,193.41
Coos .....	.....	8,940.74	.....	784.84	766.68	10,492.26
Crook, Deschutes and Jefferson .....	.....	3,680.52	.....	423.65	462.00	4,566.17
Curry .....	382.50	.....	795.65	505.66	.....	1,683.81
Douglas .....	1,873.50	8,148.99	.....	835.43	960.73	11,818.65
Grant, Morrow, Umatilla and Wheeler .....	.....	.....	3,004.93	1,337.45	.....	4,342.38
Hood River and Wasco .....	304.13	.....	.....	.....	.....	304.13
Jackson .....	773.67	.....	5,454.04	1,031.36	496.74	7,755.81
Josephine .....	.....	.....	2,716.40	812.64	480.07	4,009.11
Klamath and Lake .....	.....	6,979.31	.....	736.70	150.00	7,866.01
Lane and Benton .....	480.00	7,762.12	268.00	1,217.53	1,040.89	10,768.54
Lincoln .....	.....	1,926.74	.....	522.83	206.66	2,656.23
Linn .....	5,820.31	18,199.66	.....	833.80	526.00	25,379.77
Multnomah .....	3,952.17	.....	.....	.....	.....	3,952.17
Polk .....	2,500.00	2,503.02	.....	614.46	248.00	5,865.48
Tillamook and Yamhill .....	600.00	15,005.58	.....	1,321.30	121.67	17,048.55
Union .....	.....	729.17	.....	759.38	264.00	1,752.55
Wallowa .....	.....	1,683.22	.....	508.04	256.00	2,447.26
Airplane cooperative emergency appropriation .....	.....	.....	.....	729.52	.....	729.52
State Forester's salary as collaborator, six months .....	.....	.....	.....	.....	6.00	6.00
Spruce Production Corporation .....	.....	.....	.....	.....	.....	5,611.16
Totals .....	\$ 18,542.92	\$ 111,531.29	\$ 12,239.02	\$ 16,988.51	\$ 7,500.00	\$ 172,412.89

Prior to 1917, the cost of forest fire protection in Western Oregon averaged about two cents per acre. Local conditions throughout the state, of course, vary somewhat and the yearly average protection cost depends in no small way upon the season's hazard, but in normal years, two cents an acre was enough to cover protection costs. However, as would be expected, since 1917 there has been a considerable increase in protection costs. Labor shortage has made it necessary to increase wages of district wardens, patrolmen and lookouts, if experienced and desirable wardens were to be secured. Patrolmen are now paid from fifty per cent to one hundred per cent higher wages; pay for fire fighters has doubled and the cost of supplies and equipment followed the general market. The result is that the average cost today is not less than three and one-half cents per acre and in several counties is from four to six cents for the normal year. The costs in seasons of unusual hazard, as in 1919, far exceed the above figures.

The total amount spent in 1920 in forest fire suppression on lands outside the national forests amounted to \$84,430.42. These expenditures, which were made by local fire associations, private patrols of timber owners and by patrols acting directly under state supervision, are itemized by counties in Table No. 4. As provided by law, no fire fighting expenses were paid from the State Forestry appropriation, but all such expenses were paid by the timber owners themselves.

The contract between the War Department and the State and Federal Forest Services for airplane patrol provided that certain expenses be borne by the two Forest Service branches. These expenditures included salaries of civilian observers, night guards for the planes, rental of headquarters accommodations on landing fields, necessary transportation for the Air Service personnel to and from landing fields and telephone and telegraph service in connection with fire protection. The State Board of Forestry agreed to take care of these expenses until July 1 and the Federal Forest Service from July 1 until the completion of the air patrol. Since no funds were available by the State Forester for this work, a special appropriation was requested from the Emergency Board.

The commonwealth of this state is vitally concerned in forest protection, since, next to agriculture, it is our greatest industry. During the past season, the timber owners expended eight dollars to the state's one in safeguarding the enormous forest asset. There is every reason to believe that the state should manifest a more generous interest in protection and in cooperation with the timber owners.

A nation-wide demand for insurance against destruction of timber is rapidly gaining headway in the United States, and, in all probability, congress will, at its coming session, very materially increase appropriations for cooperation with the timbered states. However, unless Oregon sees the wisdom of appropriating much more for forest protection than formerly, then a full share of the government's cooperative funds will not be secured.

## IMPROVEMENT WORK

TABLE NO. 3

County	Old trails opened		New trails built		Telephone lines			Cabins, tool-boxes, lookouts and airplane markers repaired and built		Expenditures not segregated	Total cost
	Miles	Cost	Miles	Cost	Miles built	Miles repaired	Cost	No.	Cost		
Baker .....	5	\$ 50.00	-----	\$-----	-----	32	\$ 45.00	-----	\$-----	\$-----	\$ 95.00
Clackamas and Marion.....	118	620.00	1.25	143.17	10	42	531.69	3	732.68	399.91	2,427.45
Clatsop .....	131	540.83	20	409.89	31.5	41.5	1,763.45	-----	-----	378.38	3,092.55
Columbia .....	66	283.50	5.5	198.66	5.5	88	410.94	-----	-----	1,298.52	2,191.62
Coos .....	300	963.72	15	1,065.57	17	65	1,217.66	6	251.12	-----	3,498.07
Curry .....	37	30.00	26	3,600.00	2.5	60	168.00	-----	-----	-----	3,798.00
Deschutes and Jefferson.....	10	25.00	-----	-----	-----	-----	-----	-----	-----	-----	25.00
Douglas .....	600	1,933.17	6.75	616.47	5	23	426.06	-----	-----	24.00	2,999.70
Jackson .....	22	64.37	6	205.26	-----	15	15.00	4	244.70	-----	529.33
Josephine .....	15	41.50	.75	10.00	-----	8	76.25	-----	-----	-----	127.75
Klamath and Lake.....	55	113.00	30	710.54	13	47	391.99	1	759.04	-----	1,974.57
Western Lane and Benton.....	25	124.86	-----	-----	-----	73	174.65	-----	-----	543.41	842.92
Eastern Lane .....	68	472.00	4	50.00	-----	-----	-----	-----	-----	-----	522.00
Lincoln .....	86	620.00	-----	-----	-----	15	46.93	-----	-----	1,033.14	1,700.07
Linn .....	292	3,605.21	16	978.27	13.5	151	2,057.15	3	613.13	15.51	7,269.27
Multnomah .....	2	25.00	-----	-----	-----	-----	-----	1	8.00	-----	33.00
Polk .....	25	250.00	3	250.00	-----	41	267.86	1	77.00	-----	844.86
Tillamook and Yamhill.....	15.5	56.93	-----	-----	10.5	10	377.68	-----	-----	1,906.35	2,340.96
Wallowa .....	55	50.00	-----	-----	-----	18	63.75	-----	-----	-----	113.75
Washington .....	15.5	56.93	12.6	1,616.10	2.5	10	149.77	1	10.50	-----	1,833.30
Wheeler .....	19	40.00	-----	-----	-----	10	25.00	-----	-----	-----	65.00
Totals .....	1,962	\$9,966.02	146.85	\$9,853.93	111	749.5	\$8,208.83	20	\$2,696.17	\$5,599.22	\$36,324.17

## FIRE FIGHTING EXPENDITURES

TABLE NO. 4

County	Timber Owners			Total
	Individual patrol	Association patrol	Patrol under direct state supervision	
Baker .....	\$.....	\$ 739.72	\$.....	\$ 739.72
Clackamas and Marion .....	2,488.00	14.50	.....	2,502.50
Clatsop .....	7,270.00	14.25	.....	7,284.25
Columbia .....	10,077.71	2,026.31	.....	12,104.02
Coos .....	3,085.00	448.03	.....	3,533.03
Crook, Deschutes and Jefferson.....	107.42	120.49	59.23	287.14
Curry .....	583.91	76.00	16.00	675.91
Douglas .....	614.58	276.00	.....	890.58
Grant, Morrow, Umatilla and Wheeler .....	320.50	.....	373.09	693.59
Harney .....	.....	.....	15.83	15.83
Jackson .....	1,207.00	.....	2,132.16	3,339.16
Josephine .....	963.00	.....	812.84	1,775.84
Klamath and Lake .....	8,500.00	1,905.34	.....	10,405.34
Lane and Benton .....	92.50	650.99	26.00	769.49
Linn .....	6,564.65	714.23	.....	7,278.88
Multnomah .....	8,957.74	.....	.....	8,957.74
Polk .....	800.00	192.14	.....	992.14
Tillamook .....	1,814.65	195.33	.....	2,009.98
Union .....	.....	275.65	.....	275.65
Wallowa .....	4,113.65	12.50	.....	4,126.15
Washington .....	12,779.00	194.48	.....	12,973.48
Yamhill .....	2,800.00	.....	.....	2,800.00
Totals .....	\$73,139.31	\$ 7,855.96	\$ 3,435.15	\$84,430.42

## FIRE LOSSES

The loss of standing timber by fire during the 1920 season was comparatively very small. There were no really disastrous fires in green timber and few material losses in logging equipment.

It is true that favorable weather conditions existed during the fire period, but the slight loss in timber must not be attributed to that fact alone. Better organization and cooperation among all forest protective organizations was the real cause of last season's success. Many fires would have alone destroyed an amount of timber equal to the entire season's loss if prompt action for suppression had not been taken.

Although the average precipitation in May was the lowest ever recorded in Oregon, June averaged considerably above normal, July normal both as to temperature and precipitation, while showers during August and September brought the combined average for these months considerably above normal. The showers in August and September were almost invariably preceded by thunder and lightning storms and many lightning fires were reported. Most of these lightning fires were difficult to reach being located in the most inaccessible timbered regions. Con-



tinued showers in September, however, eliminated all further danger for the season and the services of lookouts and patrolmen were generally discontinued during the forepart of September. Unfavorable weather conditions in preceding years have oftentimes made patrol necessary for at least one month longer.

During the months of July and August when the fire hazard was greatest, fire fighters in the southern counties of the state were greatly handicapped by strong north winds which blew throughout the day and oftentimes until after night fall. This wind condition made even small fires very difficult to permanently suppress and resulted in a few cases of old fires breaking out anew after having been left as safe by wardens. But, taking the season as a whole, it may be considered as very favorable to fire suppression.

A total of 809 fires were reported as occurring on lands lying outside the national forest boundaries. A classification table of the causes of the season's fires follows:

Unknown .....	112
Incendiary .....	136
Slashings .....	144
Lightning .....	123
Hunters .....	62
Campers .....	81
Locomotives .....	35
Stockmen .....	9
Logging engines .....	60
Saw mills .....	2
Rights of way .....	20
Miscellaneous .....	25
<b>Total .....</b>	<b>809</b>

Each year improvements in the fire detection and suppression system are being developed. These may be in one way or another, but all result in enabling the patrolmen to get more rapid action on fires and to suppress them while they are yet in their incipency. Associations and timbermen by lookout, trail and telephone construction, and the airplane patrol have all contributed their share toward making the general fire suppression plan of the state a success.

Table No. 5 summarizes the fire data by counties, giving the area and character of all land burned over, together with the resulting damage to timber and other property, such as logging equipment, logs, fencing, buildings, etc. The fires, in all, burned over an area of 58,504 acres, only 30,810 acres of which were merchantable timberland. However, the remaining acreage was covered with second growth or other highly inflammable cover which adjoined valuable timber. The state policy of suppression is to put out all fires as quickly as possible, and although this necessitates expenditures for fire fighting on lands other than timbered it tends to save large fire fighting bills and materially decreases the loss of timber.

Last season's fires destroyed only 7,585,000 feet B. M. of merchantable timber, having a commercial value of \$14,954.80. This loss is relatively small and when the fact is taken into consideration that protection is being afforded approximately 9,000,000 acres of merchantable timberland the loss of 7,585,000 board feet is negligible.

## NUMBER OF FIRES AND FIRE LOSS

TABLE NO. 5

County	Number of fires	Areas burned over Acres			Merchantable timber destroyed or damaged M. feet B. M.	Monetary value of timber destroyed or damaged	Estimated value of build- ings, logs, equipment and improvements destroyed
		Merchantable timber	Second growth	Cut-over lands, brush, old burns			
Baker .....	27	361	237	2	40	\$ 51.00	\$ .....
Benton .....	11	.....	21	300	.....	.....	1,500.00
Clackamas .....	29	13	1	152	.....	.....	60.00
Clatsop .....	38	250	1,010	1,062	.....	.....	10,600.00
Columbia .....	24	21	40	4,204	40	120.00	15,400.00
Coos .....	35	277	5	744	1,003	2,006.00	39,355.00
Crook .....	15	250	5	.....	57	114.00	.....
Curry .....	13	30	5	656	4	6.00	20.00
Deschutes .....	4	313	200	.....	6	9.00	.....
Douglas .....	136	838	802	1,818	669	865.00	2,000.00
Grant .....	7	1,476	10	.....	145	195.00	.....
Harney .....	3	30	.....	.....	5	5.00	.....
Hood River .....	.....	.....	.....	.....	.....	.....	.....
Jackson .....	92	2,178	525	539	596	582.00	2,391.00
Jefferson .....	2	25	.....	.....	.....	.....	.....
Josephine .....	77	2,616	524	5,652	118	153.00	2,309.50
Klamath .....	36	18,449	340	1,010	2,741	7,524.80	7,700.00
Lake .....	20	2,228	.....	.....	677	1,037.00	.....
Lane .....	40	379	276	686	836	844.00	25.00
Lincoln .....	8	.....	.....	226	.....	.....	.....
Linn .....	45	89	50	840	60	120.00	.....
Marion .....	11	44	.....	18	.....	.....	80.00
Morrow .....	1	1	.....	.....	.....	.....	.....
Multnomah .....	2	.....	.....	41	.....	.....	.....
Polk .....	7	25	200	1,765	.....	.....	.....
Tillamook .....	42	.....	10	666	50	50.00	.....
Umatilla .....	7	38	28	19	23	43.00	15.00
Union .....	3	15	10	4	.....	.....	.....
Wallowa .....	8	9	.....	902	385	770.00	1,525.00
Wasco .....	.....	.....	.....	.....	.....	.....	.....
Washington .....	42	256	80	1,382	70	175.00	14,301.00
Wheeler .....	8	474	25	25	10	15.00	50.00
Yamhill .....	16	125	1	576	90	270.00	9,515.00
Totals .....	809	30,810	4,405	23,289	7,585	\$ 14,954.80	\$106,846.50

## AIRPLANE PATROL

At the suggestion of the Air Service branch of the army, a conference for the purpose of formulating plans and methods for the forest patrol was called at March Field, Riverside, California, from February 20 to March 20, 1920. Members of the State Forestry Board and the United States Forest Service were invited. The period of instruction lasted for thirty days and was highly successful in its purpose. The attending representatives from the forest agencies were given a thorough training in the organization of the Air Service and a working knowledge of the equipment of the Air Service that would be used in the patrol. By means of a series of lectures, the policy and organization of the forest protective agencies was set before the attending members of the Air Service. Special reference was laid on forest fires, their danger, and the great need of prompt action. Practice flights were given the forest representatives to acquaint them with the problem before them.

As a whole the conference was a success. It resulted in a common understanding of the fire problem and settled to some extent the methods and organization which would be needed. Fundamentally, it cemented a feeling of mutual understanding between the two organizations and provided a common language and purpose.

The second Oregon forest patrol covered a period during 1920 of from July 1 to September 15. The patrol was divided into two units, one being stationed at Medford and the other at Eugene. The Eugene base was the main operative base of the patrol and headquarters for both the army and the protective agencies. Medford was designated as a sub-base from which one patrol was flown daily. Portland was used as a supply depot in connection with the patrols from the main base at Eugene.

The patrol as a whole was divided into two parts: the flying and the observing and reporting. The Air Service of the army had complete charge of the former and the United States Forest Service, working for the protective agencies of Oregon, controlled the latter. The Air Service furnished and maintained all of the flying equipment and personnel. The observers and liaison officer at each base were employed by the United States Forest Service, this being made possible by an appropriation of \$50,000.00 by congress to be used in cooperation with the Air Service.

Flight A of the 91st Aero Squadron, under command of Captain Lowell H. Smith, was assigned to the Oregon patrol. Lieutenant E. C. Batten had charge of the main base at Eugene, and Lieutenant W. D. Goldsborough of the Medford base. Captain Smith was in charge of the patrol as a whole. Four airplanes were assigned to the Medford base and seven to the Eugene base. Each airplane was equipped with radio sending apparatus. Each base and the supply depot at Portland was equipped with a radio receiving set under direct charge of men from the Signal Corps of the army.

Two observers were assigned to the Medford patrol and four at Eugene. At each base and at Portland, the Forest Service established a clearing-house of fire reports from which reports were forwarded from the patrols to the particular protective agency concerned. Each clearing-house was under the charge of a member of the United States Forest Service.

Regularly each morning the patrols took off and swung out over their courses for the day. From Eugene two patrols were operated, one going north along the west side of the Cascades to Portland and returning along the summit of the Coast Range to Eugene in the afternoon, and one going south along the Coast Range in the morning to Medford, returning along the Cascades in the afternoon. One patrol was supported from the Medford base. Leaving Medford, this patrol swung east—south of Crater Lake, thence south to Alturas, California, connecting there with the California patrol system. In the afternoon this patrol came back directly to Medford.

The airplanes, or "ships" as they are commonly called, were flown by Air Service pilots. Each ship carried one observer, whose sole duty was to find fires and report them by radio to the nearest base. The pilot and observer worked in cooperation, each helping the other as much as possible to get the best results.

Upon taking off, the ships circled the home field, tuning their radio equipment with that of the ground receiving station. No ship was allowed to leave the field unless its radio set was in good working order. As soon as an O. K. panel, consisting of two parallel strips of white cloth laid on the ground, was seen, the ship turned off immediately on its course for the morning.

Aided by the cooperation of the State Board of Forestry and the Western Forestry and Conservation Association, the United States Forest Service compiled a set of maps to be used during the patrol. As far as they were available, the United States Geological Survey quadrangles were used. The quadrangle sheets constitute the best maps existent in Oregon at the present time and are very well adapted to flying. Unfortunately, they cover but a small portion of the state. To fill out the State Forester's map, the national forest base maps were used.

The observer carried maps of the country over which the patrol route laid. On these maps were spotted all of the fires which had been discovered up to that time. As he passed over the country, he noted the character of each fire and reported it to the nearest base by wireless. When a new fire was seen the observer directed the pilot to it. Circling around the fire, the observer compared the country with his map, thus locating the fire. As soon as he had located the fire he filled out an especially prepared form covering its size, character of material in which it occurred, slope, wind velocity, and nearness to any distinguishable landmarks. This form he immediately sent by wireless to the nearest base. The observers were instructed to stay over a fire until they were sure of the location which they reported. Care was exercised throughout the patrol to get the location of the new fires as accurately as possible, in order that any unnecessary work might be avoided on the part of the suppressive force.

Two observers were assigned to each patrol, alternating the days on which they flew. This same plan was carried out in regard to the pilots. It has been found in the Air Service that a man cannot stand long flights daily on account of the changing altitude. The observers were confined solely to the route to which they were assigned. They worked together in cooperation throughout the season. Every morning,

before going out, the observer would go over his maps carefully with the observer who had been over the route the day before. In this way, each observer was kept constantly posted on the new fires occurring from day to day.

During the first part of the season, definite routes were laid out over which the patrols were supposed to fly. It was found in actual operation, however, that to secure the best results the patrol could not be confined to these routes closely. In nearly every case the patrol went to the new fire so that an accurate location could be made. By so doing, no definite route could be followed.

Each route comprised a flight of approximately two and one-quarter hours, depending on conditions. When many new fires were found, the time consumed was longer. A landing was made at the far end of the route at noon, two hours being taken for lunch and preparing the ship for the return trip. An altitude of approximately 10,000 feet was used during the most of the season. This varied somewhat, due to weather conditions. During the period when the smoke from large fires covered the country, it was found that better results could be obtained by flying at higher altitudes. A record of 17,500 feet for the patrol was established during this time.

The ships used were Model 4B De Havillands equipped with a 400-horsepower Liberty motor. For the hard work that these ships were called upon to do, this type seems to be very well adapted to patrol work. They are large, fast and steady. The motors performed admirably throughout the summer, only three forced landings being necessary, two of these resulting in crashes.

No injuries other than two minor ones were incurred during the course of the summer. No chances were taken and the extra caution resulted in a very good record. The men, both army and Forest Service, took an active interest in the work and did their best throughout the summer to get results. The final results of the patrol show that every effort was used to make the patrol successful.

As soon as the fire reports came in from the observers en route, they were turned over to the liaison officer at the base. Each new fire was immediately spotted on a map and checked to avoid reporting of the same fire twice. Then the report was forwarded either by telephone or telegraph to the headquarters of the responsible agency for its suppression. A system of reporting was worked up between the bases that was fairly efficient, each base being allotted a certain territory in which all fires were reported, thus avoiding reporting from two different bases. This system proved to be slow in some cases, as the reports from one base to another were not forwarded until the ship landed. A check of all of the fires reported on a flight which occurred in one liaison officer's reporting district was made over the telephone immediately upon landing of the ship. This was done so that all errors which might come in through the wireless might be picked up and corrected. Under usual circumstances, all reports from the ships while in flight were repeated.

The seasonal summary of fires reported by the air patrol is not in all cases correct. In several instances, slashings being burned under permit and small saw-mill smokes were reported as forest fires. In some cases,



FOREST PATROL PLANE NEAR MT. JEFFERSON

the cooperation of the forest officers was not all that could be desired, since they failed to check back the location and condition of the fire as reported by the air patrol. However, the entire patrol reported a total of 719 fires with 89 per cent efficiency in their location. Of the total number, 412 were reported by radio with an average elapsed time of 61 minutes between discovery and report to liaison officer, while 307 smokes were reported verbally upon landing, with an average elapsed period of one hour and 28 minutes.

The following table is taken from the Department Air Service Officer's report dealing with the Oregon patrol. It shows the performance and efficiency of the airplanes throughout the course of the patrol:

Base	Number of patrols	Time in minutes	Number of square miles covered	Number of miles flown	Forced landings
Eugene .....	118	29,415	2,105,685	57,880	1
Medford .....	71	16,460	975,818	32,920	2

On September 15, 1920, the forest patrol season was discontinued, due to the fall rains ending the fire season. The fire season of 1920 was an uneventful one, fortunately, as regards any great loss of timber from forest fires. There were many fires, however, of the damaging variety, but, as a whole, they were confined to small areas and controlled before they had gained sufficient volume as to become dangerous to green timber.

The contract between the forest protective agencies of Oregon and the Air Service called for the former furnishing the observers, transportation at the fields, and all necessary incidental expenses that might arise concerning the landing fields and the office equipment thereon. The Air Service furnished the airplanes, personnel to maintain and operate, and supplies to operate, and transportation from winter station to the forest patrol bases and return of all personnel and equipment.

A special appropriation by congress of \$50,000.00, \$12,000.00 of which was allotted to the Oregon patrol, was used for expenses incurred by the forest agencies. This appropriation did not become available until after the first of July. The expenses incurred before that time were borne by the State Board of Forestry. The total cost of the patrol, including the hire of the observers, telephone and telegraph charges, the salaries and expenses of the liaison officers, and transportation at the landing fields, was fully covered by the \$12,000.00 allotment.

At the present time, there are no figures available showing the cost of the patrol to the Air Service.

The cooperation of the Air Service was complete in all details and all that could be asked for. The whole personnel seemed to gather the enthusiasm and thoroughness of the commanding officer, Captain Smith, showing it in the willingness with which work was undertaken and executed.

The greatest recommendation as to the forest patrol is that the necessary authority and appropriations be secured to make it a permanent

yearly affair. The patrol is an added precaution to the forests, which operate separately as a forest fire detection system, and at the same time works in conjunction with the lookout system. The advantages of the patrol fill in the disadvantages of the lookout system in such a way that no fire will escape notice long.

Next year a conference of the state fire wardens and the supervisors of the national forests should be called before the patrol starts operation and the whole situation gone over carefully. Special reference should be paid to the part that every warden or supervisor should play in the scheme.

There are many minor details in the organization of the patrol which will have to be worked out next year. These details relate primarily to the reporting of the fires to the field after they have been reported in by the patrols. The elapsed time consumed in such reporting this year averaged too much for real efficiency.

In conclusion, the results of the patrol for this year, the first year of its operation with cooperation of all interested agencies, shows a decided need for it. There is no way of definitely telling how many fires were confined to small areas as a result of the patrol. There is likewise no way of determining the moral effect of the patrol in those areas where the ranchers have been accustomed to burning over brushy areas whenever the idea struck them. The total number of fires for the season 1920 is much lower than the average.

The benefits of the forest patrol are not solely confined to the forests. The Air Service of the army received a large portion of the benefits. The patrol offers a work for the Air Service which is entirely worth while during the course of which opportunity is presented for excellent training for both pilots and mechanics. There is no other training for observation that equals that furnished by the patrol. It is a constant war game demanding keen attention at all times. The patrol demands the best from the pilots and the mechanics.

## SLASH DISPOSAL

One of the most vital problems with which fire protection agencies have to contend is the disposal of the debris caused by land clearing, logging operations and various construction enterprises within the timbered areas of the state.

The nature of the forest cover, especially in Western Oregon, is such that after a timber removal operation the debris constitutes a very serious fire hazard.

With the rapid growth of the logging industry, agricultural development and highway and railway construction, this hazard is becoming more of a problem each year and must be given more thought and attention if we expect to materially decrease the number of fires originating from this cause and thereby prevent serious losses in standing timber and in property.

The great majority of operators, while anxious to comply with the law in this regard, are seriously handicapped at certain seasons by



weather conditions and the very nature of their operations. While the law requires an operator to burn his cuttings annually, weather conditions are often unfavorable for either spring or fall burning and, during the dry period, the chance of confining the fire to the desired area without its spreading to contiguous areas of active operation is so uncertain that many operators do not care to risk the loss of equipment, logs and timber which they are liable to sustain if the burning was done during that period. The fact remains, however, that a very large percentage of the loss sustained by operators through the loss of equipment and logs and many of our most disastrous fires, from the standpoint of loss in standing timber, can be directly traced to the slashing of the operator or rancher which was not burned at the proper time and in which fire originated accidentally during the dry season and could not be controlled or confined to the cut-over area. During the 1920 season, 144 fires originated from or may be directly attributed to slashings. More fires resulted from this one cause than from any other. The loss in logs, logging equipment and other property amounted to \$106,246.50, exceeding the total loss in merchantable timber by \$91,691.70. A very large percentage of this loss may be traced to failure of logging operators in slash removal during proper periods.

Owing to the lack of funds, it has been impossible for this office to keep its field force employed for a period of enough length to properly enforce the law in this regard and to actively supervise and assist in the removal of this menace to our standing timber. During the past year, late spring and early fall rains made it exceedingly difficult to dispose of slashings, and while a considerable area was burned under permit and by fires of accidental origin during the closed season, there are thousands of acres of logging slash and ranchers' clearings which should be disposed of before the next fire season.

A total of 255 burning permits were issued during the closed season and under these permits 9,367 acres of slashing were burned. About the usual amount of burning was done before and after the closed season but no figures are available on the exact acreage.

Fire protective organizations throughout the state are fully alive to the importance of slash disposal and are anxious to cooperate in any plan that will lessen the risk caused by unburned slashings.

It is to be hoped that sufficient funds will be made available by the 1921 legislature to place special men in the field, who, with the cooperation of the wardens of the various protective organizations, may devote enough of their time to slash disposal to completely carry out the provisions and spirit of the law. With the rapid increase in the cut-over area, it is certain that such a force would be profitably employed and through their efforts greatly decrease the possibility of timber and property loss from this source.

A very large percentage of the land being logged in the state is chiefly valuable for the production of timber. In accordance with the policy of the Board of Forestry, every encouragement should be given to keep such land in a productive state. Soil and climatic conditions throughout the state are favorable for natural reforestation and with the proper disposal of logging debris as the first step, nature will then

do her part in the process of reproduction on absolute forest lands. The State Board of Forestry fully realizes its responsibility in this connection and will use every effort to encourage and enforce the removal of slashings not only for the protection of our present stand of timber, but for the future good of the lumber industry.

### FOREST FIRE LAW ENFORCEMENT

Oregon's forest fire laws aim to protect the timberland and property of the state as a whole from the carelessness and maliciousness of the few. In its law enforcement program the State Board of Forestry has always worked on this assumption and has never resorted to law enforcement as a form of vengeance or retribution.

Records on state patrolled timberlands covering a ten-year period show that approximately 75 per cent of all fires are man-caused. A study of these man-caused fires is convincing in that practically all of them could have been prevented by the exercise of proper care, either in removing some dangerous slashing, cleaning the ground around a camp fire, or taking some other obvious precaution.

It is also apparent that one of the fundamentals of a progressive forestry program must be the prevention of fires by the elimination of special existent hazards. In order to bring the forest fire hazard under control a vigorous exercise of the police powers is absolutely necessary, and in order that the effort may be combined and effective there must be active cooperation and assistance from the public, the press, and from the local county officials in the education of those inclined to be thoughtless or careless with fire in the woods.

The forest fire laws of Oregon provide penalties and punishment for originators of the man-caused fires. The law is adequate in this respect. Proper enforcement of the law has, however, not been without certain difficulties—the principal one being the lack of funds to properly carry on field activities in law enforcement. At least one inspector should be employed for this particular work.

Experience has proven that very limited results may be expected from the local patrolman along this line of work. He is first of all principally concerned in fire suppression and, either through lack of personal endeavor or through lack of knowledge in the proper procedure in such cases, he accomplishes little in actual law enforcement. On the other hand his inside knowledge of local conditions is extremely valuable to anyone working up a case. Probably no one duty of a fire warden is more generally disliked than the apprehension of forest law violators. Consequently this branch of the work is probably less efficiently handled than any other.

In 1919 this department received the services of a special forest officer employed by the United States Forest Service in working up state as well as federal forest fire law violations. His record of 96 prosecutions is indicative of what can be done by specialized effort. The services of this officer were employed principally outside of Oregon in

1920 and no one was employed by the state to replace his efforts with the result that only 48 cases were taken up for action, listed as follows:

Leaving camp fire burning.....	25
Allowing fire to spread.....	4
Cigarette .....	1
Defective spark-arrester .....	1
Brush burning without permit.....	5
Incendiary .....	2
Starting fire on lands of another.....	1
	<hr/>
	39

Cases under investigation as follows:

Leaving camp fire burning.....	3
Brush burning without permit.....	3
Incendiary .....	3
	<hr/>
	9

At present the district wardens act as direct agents of the State Forester for all field work. This works quite satisfactorily but needs reinforcing by at least one officer who is thoroughly conversant with forest law enforcement and who may be called upon to assist the district wardens in special cases. It would then only be a short time before the district wardens would themselves learn the process of handling violations.

In the past, the state has followed the idea that local education on fire danger together with cooperation for community betterment might overcome the fire evil. Telephone lines have been built and phones installed gratis in certain forested regions where the settlers' services might prove beneficial in fire suppression. Pastures have been fenced, roads, trails and cabins have been built, and communities invited to share in their benefits. The hoped-for results have not been forthcoming. It is believed that a fair and square policy of active law enforcement will not only decrease the number of forest fires but will gain the respect and cooperation of all law abiding citizens.

It is therefore believed that with supervisory action by the state for the elimination of certain known hazards, the continued education of the public, and finally criminal prosecution where necessary, the forest fire problems of the state will be greatly reduced.

### COMPULSORY FOREST PATROL LAW

Prior to 1913, the furnishing of patrol for privately owned timberland in Oregon was optional with the owner thereof. The progressive timber owners had for some time been patrolling their holdings either individually or jointly with other owners. The cooperative idea had taken root as early as 1905, when cooperative associations began active operation. The greatest weakness in connection with association work was that the contributing acreage constituted too small a proportion of the total area patrolled, or, in other words, there was a large area of

timberland protected by the associations which did not pay its proportionate share of the cost of such protection. Some of these backward timber owners did not affiliate with the associations because they still considered forest fires an unavoidable evil, while others figured that the association would of necessity have to protect all timberlands within its boundaries in order to protect the contributing acreage and that they were, therefore, getting their protection free of charge. This weakness the compulsory patrol law aimed to remove by making it obligatory upon timber owners to provide patrol for their holdings. The Oregon compulsory patrol law was enacted in 1913. The law is founded upon the principle that if protection of timber against fire is considered necessary by over 50 per cent of the owners of this class of property and by the public generally, it is necessary for all owners, and logically all owners should share in the cost of maintaining the force required to give adequate protection. Under the provisions of the compulsory patrol law, a timberland owner may patrol his own land independently; have his property patrolled by a fire patrol association or allow the State Forester to provide patrol.

The compulsory forest protection law of Oregon is at present undergoing much attention for three distinct reasons:

(a) It has been tried long enough to develop a few needs of minor change which interest the State of Oregon itself.

(b) It is being used as the basis of similar legislation proposed in other states.

(c) It is attracting still broader attention as perhaps indicative of the manner in which other far more troublesome police power problems in forestry will be solved, since it is essentially cooperative and also affords reasonable means of determining the performance that may properly be required of the reluctant.

The principle of the Oregon law is based wholly on the police power of the state. It is neither taxation nor insurance and does not recognize the value of the property involved. It rests solely on the premise that the individual may not maintain a menace to the life, property or legitimate enterprises of others and that such a menace exists in unprotected land from which forest fire may spread. He is, therefore, required to provide adequate protection. If he does not, the state may provide it and make him pay the cost it has thus been obliged to incur to protect its citizens from the illegal danger for which he is responsible.

The constitutionality of this exercise of police power has been upheld by the courts in preceding application under noxious weed laws, requiring property owners to destroy such weeds and providing for destruction otherwise by the state at their expense. Opinions handed down by Attorneys-General have upheld the constitutionality of this particular law. The cost is a recoverable lien on the property. The hazard is the issue, and the cost involved must be based on the hazard, regardless of the value of timber or land. It may even be cut or burned-over land if forest fire-hazard to the community still exists.

The Oregon law appeals to another principle at least of sound justice. This is the provision that the land shall be deemed adequately protected if the owner furnishes protection equal in standard, efficiency and duration to that maintained by others, under organization and satisfactorily to the

state. In other words, no owner may be compelled to do more than is voluntarily done by his neighbors who are in position to know what is necessary and who do it in their own interest. Since they would hardly do more than is necessary, he is automatically protected against imposition. He may join them or not as he pleases. They are protected, however, against his doing nothing and thereby saddling them with the cost of protecting his land also, in order to protect their own, which is a common injustice in states without compulsory patrol laws.

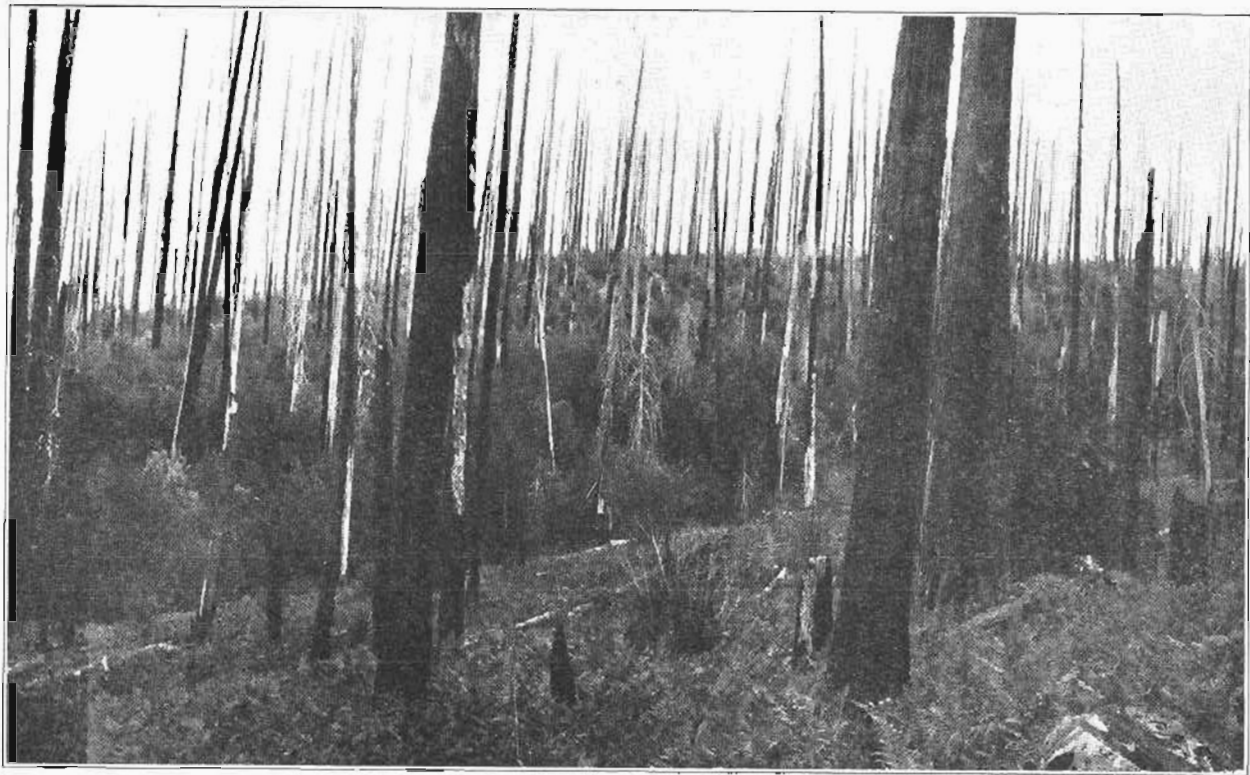
The tendency of the law is to bring about the fullest organization of private effort, thus to simplify relations with the state and with other owners which results in great assistance to the state and advancement of protection generally. It engages the capital, intelligence, local familiarity and every other facility of private ownership, making all available to the state. As a rule, the state finds it advantageous to contract the protection of neglected lands to these organizations, rather than undertake the work itself, for two obvious reasons: they are covering the region anyway, hence no additional machinery is needed, and they finance the work, so only ultimate collection from the delinquents instead of actual assessments falls upon the state.

Other details of the law are likewise of interest.

Forest land is deemed adequately protected if the owner lives within one and one-half miles thereof. This is to exempt settlers, and probably expedient. However, the actual application of this single exemption clause necessitates a never-ending amount of detailed field and office work. Experience has shown that little actual patrol and fire fighting can be expected from the resident owner.

The costs incurred by the state are collected as taxes are collected by extension on the tax rolls, and paid by the county officials to the State Forester who incurs them. This method is to avoid the almost hopelessly burdensome and expensive process of recovery by suit to foreclose lien on the great number of land parcels involved, but is not taxation. In the eight years of experience in Oregon, it has developed no difficulties except minor ones in defining its distinction from taxation. It has been ruled that hazard, not value, being the governing factor, lands may not be classified at different rates of protection cost, as timber, second-growth or cut-over, on any basis except that of actual cost according to hazard.

A serious weakness exists, however, in a statutory maximum of five cents an acre that may be expended and collected by the state. This arbitrary figure was set solely for expediency when the legislation was experimental and when all work was much cheaper than it is now, to avert opposition on the ground that unnecessary or excessive cost might be incurred. In practice, the principle previously described of measuring the required effort by that voluntarily incurred and approved by the state has proved a far better measure of both the necessity and cost of work. In easy years and hazards, the cost has been very low, much below the five cent maximum. When hazard has been excessive, the necessary voluntary effort by state and owners has exceeded the limit but been applied equally to non-cooperating land. Owners of the latter, thus protected from the heavy loss threatened at such times and without any excuse for not paying for protection actually proved necessary,



WHEN OLD BURNS ARE PROTECTED FROM FIRE NATURAL REFORESTATION FOLLOWS

consequently escape the very assessment they should pay most of all and do so at the expense of others when these are paying the most. The result is that many deliberately do nothing and go on the tax rolls so as always to be protected by the five cent maximum. Obviously, if all did this, the system would break down. There should be no maximum other than that determined by the good faith work of those who are paying the bills at the time.

Administration of the law is not yet without its difficulties. A large amount of clerical work is required to keep records of ownership up to date and cases continue to arise where it is difficult to decide whether or not land should be assessed. The law wisely gives wide latitude in determining what is and is not assessable property. It has been the desire and policy of the State Board of Forestry to deal in a common-sense way with border-line properties and in the main there has been little dissatisfaction. Along this same line future problems will be involved.

Other forest laws require cleaning up of cut-over areas to remove hazard. If complied with, they may also require exemption from the patrol law based on hazard which will, however, return in time; moreover, the protection of second-growth occurring on them will be good public policy.

To sum up, the compulsory patrol statute has been the most valuable in our forest code. It accomplishes prevention, which is the most essential thing. It deals fairly with all owners, removing a great abuse by the delinquent in taking advantage of the work of others and of the state. It has directly collected through the state about \$50,000.00 a year for fire work in Oregon, to say nothing of the expenditure by owners which it compelled. It has greatly perfected organized private effort, thus relieving the state of a great amount of detail. It has further greatly improved the cooperative relations of owners, state and government, not only increasing economy and effectiveness of fire work, but paving the way for dealing with other forest problems, and, at the same time, giving the state its commanding and proper part in developing forest policies, yet without failure to recognize the wisdom and assistance of the other agencies involved.

### FIRE PATROL ASSOCIATIONS

The state, under provision of the compulsory patrol law, contracts with associations formed by timber owners for the patrol of all timberland coming within association boundaries and not being otherwise protected. This protection plan has generally proven satisfactory, because the patrol machinery of the associations saves the state the necessity of duplicating the work and only the collection of taxes from delinquent owners falls upon the state.

The associations are functioning the same as explained in previous reports.

The state cooperated with seventeen associations last season. The only change in their organization over 1919 being a division of the original Union-Wallowa Association into two separate associations, viz: one for each county. The patrol boundaries of several associations were changed to better meet field and administrative conditions.

## ACREAGE PATROLLED BY LOCAL COOPERATIVE FIRE PATROL ASSOCIATIONS

TABLE NO. 6

Association	Name and address of secretary	Acreage represented by members	Acreage patrolled under contract with state	Acreage O. & C. lands patrolled for U. S. gov't	Total acreage patrolled
Baker County Fire Patrol Association.....	W. E. Palmer, Baker, Oregon .....	182,272	63,473	-----	245,745
Blue River Forest Fire Patrol Association .....	L. E. Bean, Eugene, Oregon.....	21,836	10,277	-----	32,113
Central Oregon Fire Patrol Association.....	J. H. Haner, Bend, Oregon.....	295,761	161,179	-----	456,940
Clackamas-Marion Counties Fire Patrol Association .....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	135,125	50,838	63,700	249,663
Clatsop County Fire Patrol Association.....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	249,736	73,828	-----	323,564
Columbia County Fire Patrol Association.....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	155,365	75,127	32,700	263,192
Coos County Fire Patrol Association.....	Carl L. Davis, Marshfield, Oregon.....	298,771	80,347	200,200	579,318
Douglas County Fire Patrol Association.....	H. O. Pargeter, Roseburg, Oregon.....	263,601	318,902	374,800	957,303
Eastern Lane County Fire Patrol Association .....	A. C. Dixon, Manager, Eugene, Oregon.....	195,950	136,174	80,900	413,024
Klamath-Lake Counties Forest Fire Association .....	Jackson F. Kimball, Klamath Falls, Oregon.....	381,178	329,847	55,400	766,425
Lincoln County Fire Patrol Association.....	Ira Wade, Toledo, Oregon .....	70,975	89,441	10,000	170,416
Linn County Fire Patrol Association.....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	204,580	68,848	57,000	330,428
Polk County Fire Patrol Association.....	W. V. Fuller, Dallas, Oregon.....	87,123	11,766	41,100	139,989
Tillamook County Fire Patrol Association.....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	335,316	136,011	24,000	495,327
Union County Fire Patrol Association.....	J. L. Cramer, La Grande, Oregon.....	81,578	111,696	-----	193,274
Wallowa County Fire Patrol Association.....	J. F. Ravenscroft, Wallowa, Oregon.....	82,249	64,395	-----	146,644
Western Lane County Fire Patrol Association .....	C. C. Scott, 505 Spalding Bldg., Portland, Ore.	122,561	203,559	157,600	483,720
Totals.....	-----	3,163,977	1,985,708	1,097,400	6,247,085



In Table No. 6 will be found a list of the associations, together with the names of secretaries and a classification of the status of the acreage patrolled. A total of 6,147,085 acres was patrolled by these seventeen associations. Association members represent 3,063,977 acres; O. & C. R. R. grant lands 1,097,400 acres, and the balance of 1,985,708 acres was patrolled under contract with the state.

The State Forester provides patrol for the balance of all timberlands other than those protected by the associations, acting as agent for the timber owners in accordance with the compulsory patrol law. In addition several private patrols are maintained by individual timber owners in accordance with instructions from the State Forester.

### WEEKS LAW AND O. & C. COOPERATION

The federal government in 1911 recognized the fact that the state and privately owned forests must be regarded as a national asset as well as those lying within the boundaries of the national forests, and should receive federal assistance in protection from fire. In recognition of this fact and with the desire to stimulate and encourage forest protection in all timbered states, the Weeks law was enacted. Among other things, this law provides limited funds for cooperation with states in their protection from fire of forested watersheds on navigable streams.

The original Weeks law allotment amounted to \$100,000.00. It remained the same amount until 1920 when it was increased to \$125,000.00. This fund is distributed to the states maintaining by law a forest protection system. All funds so distributed to the states must be matched by equal state expenditures and the maximum amount allotted any one state is \$10,000.00 for each fiscal year. Evidence that the conduct of protective work in this state is endorsed by the federal government is evinced by the allotment to Oregon each year of the maximum amount. However, this maximum amount has decreased from \$10,000.00 in 1911 to \$7,500.00 in 1920. This is due to the fact that each year additional states have been coming in under the provisions of the Weeks law while the total amount for distribution has remained practically unchanged. Therefore, the maximum portion to each state has necessarily been decreased.

It is a well known fact that the costs of forest protection have increased in line with all other lines of endeavor during the past few years. Since the federal allotments, in spite of this fact, have decreased, it is quite evident that federal cooperation has decreased rather than increased during the past few years.

The Federal Forest Service recognizes the inadequacy of the present Weeks law allotment and is taking steps to have the fund materially increased. This move is in line with the new national forest policy and conforms to the recommendations made in Oregon's forest policy.

During the past season, a total of 31 federal patrolmen were employed. Their period of service generally extended from July 1 to September 10. The total allotment of \$7,500.00 was expended for patrol and lookout purposes in the field.

This financial assistance received from the federal government has become an important factor in the development of forest protection work in Oregon.

In 1913, title to approximately 2,300,000 acres of railroad grant land was forfeited by the Oregon and California Railroad Company and this entire grant reverted to the federal government.

The government's grant to the Railroad Company originally dated 1866. This grant was later amended and included practically every unpatented odd section of land lying within a thirty-mile radius from their right of way. The grant extended from the northern to the southern boundary of the state. Naturally the character and cover of these lands ranged from those of agricultural value to those covered with magnificent stands of virgin timber, while the whole grant included its proportionate share of barren, burned and brush areas.

The federal government realized that classification must necessarily precede proper administration, and with this idea in view a general classification was made a few years ago. This examination was not intensive and in general resulted in little more than a general classification as to whether or not the lands were covered with timber.

Naturally upon the federal government's acquisition of these O. & C. lands, the Railroad Company was relieved of its duty in providing protection for the forested areas. Congress has annually made manifest the federal government's responsibility for their protection by a \$25,000.00 appropriation. Each timbered acre of O. & C. land within the state bears its proportionate share of the protection costs equally with that of the private owner. During fire seasons of low hazard, this \$25,000.00 has been ample to meet all proportionate costs, but emergency appropriations have been needed to make up deficits during seasons of unusual hazard.

All O. & C. lands lying within the national forest boundaries have logically fallen under the Federal Forest Service for administration. The federal government contracts with the fire patrol associations and with the State Forester for the protection of O. & C. lands lying outside the national forest boundaries.

Prior to 1920, the \$25,000.00 O. & C. allotment was disbursed for the protection of the timbered lands only, while the state bore the burden of protecting many acres of brush and burned over lands. During the past season, however, a more equitable administration of these funds was made whereby all O. & C. lands covered with inflammable cover contributed toward bearing the total cost of protection. This is the only equitable adjustment, since, in this way, the federal government assists and recognizes the state's endeavor to protect not only the timbered lands but also those areas adjacent to and intermingled with them comprised of old burns, logged-over and inflammable brush lands. Since thousands of acres of O. & C. land fall under this classification, it is only just that the government bear its share of the responsibility in providing protection so that reproduction may follow and so that suppression action will be immediately taken on these areas as well as on the strictly timbered lands.

It is necessary that the O. & C. federal appropriation be not only continued but be increased. This sum should be large enough to enable

federal settlement of the proportionate share of the total costs of patrol, improvement and fire fighting on O. & C. lands. Insufficient appropriations have in the past delayed settlement for the protection of O. & C. lands and placed local associations in financial difficulties.

### PINE BEETLE CONTROL

Oregon is the banner state of the Union in timber resources. Nature has endowed us, the people of this state, with a great heritage of trees now ripe for market. But the very magnitude and extent of these same possessions have also imposed on us tremendous responsibilities, for Nature has a tricky way of destroying in a day that which she has slowly wrought during centuries. Most of us now realize the necessity and obligation of preventing the spread of forest fires which in the past have converted great tracts of timber into worthless wastes. The proof that we do know is embraced in our excellent forestry code which, though it needs some revision and more drastic penalties, represents the constructive effort of a great people to protect their community property.

If fires were the only menace to our forests there would be no occasion for this chapter, but unfortunately in Eastern Oregon in our great bodies of pine timber, tree-killing beetles are annually reducing the stands at an alarming rate. In that connection two very significant factors appear:

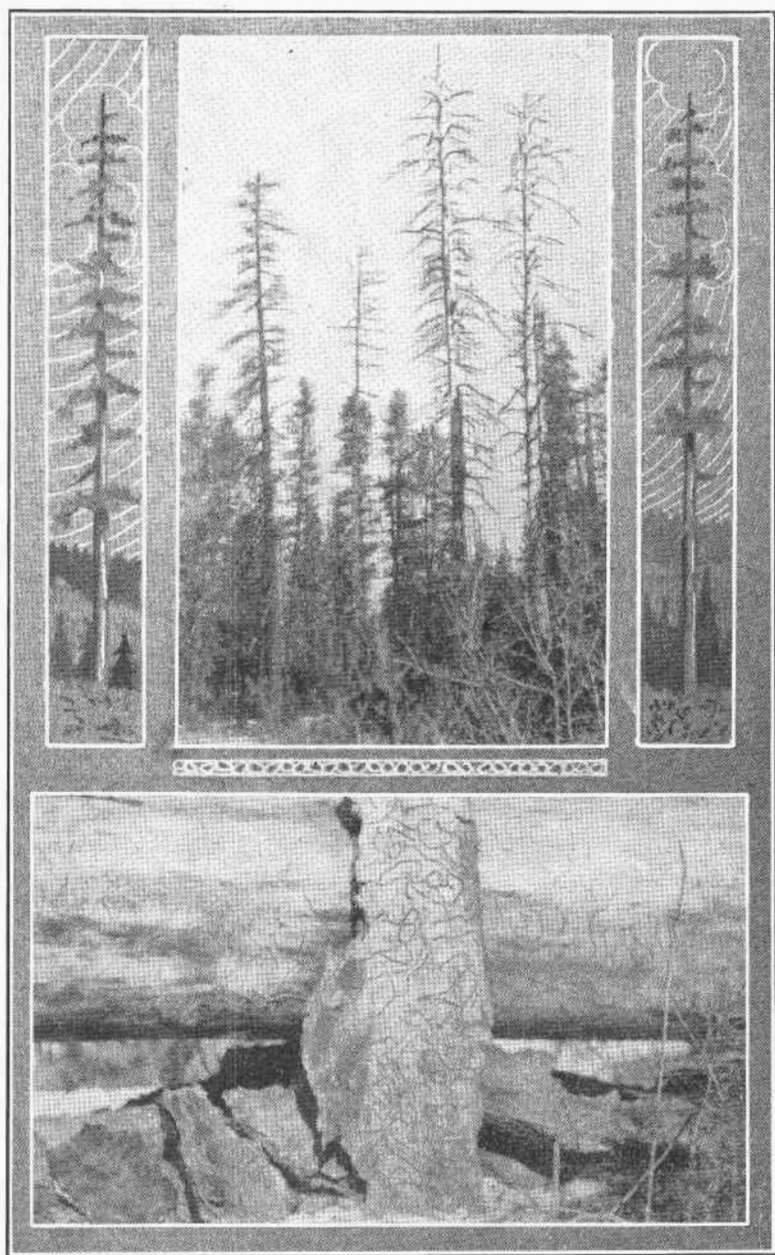
(1) The people of this state generally are not aware of the real situation, hence our code makes no special provisions for combating the beetle, and (2) this destruction is distributed over almost the entire pine area and is rapidly increasing year by year.

The following is taken from the report of W. J. Chamberlin, Forest Entomologist, Oregon Agricultural College, who spent several months in an investigation of the pine beetle situation in Klamath county during the past summer:

"There have always been present in the yellow pine forests, insects which feed upon the various parts of the trees. The most destructive pest in western pine stands is the western pine bark beetle (*Dendroctonus brevicornis*), a tiny, dark-brown beetle which bores through the bark of the tree and excavates long, winding galleries in the cambium. In these galleries the beetles deposit small, white eggs, which hatch into tiny worms. The worms feed upon the cambium and inner bark, excavating their own galleries into the bark in search of food. Each worm later transforms into a beetle, which digs its way out of the tree and joins others of its kind to attack and kill other trees.

"The effect of these hundreds of insect galleries is to girdle the tree, thus cutting off its supply of food and water and causing death.

"Normally these insects prefer weakened, dying or recently felled trees and in the original virgin forests they attacked windfalls and trees injured by fire, lightning, snow, frost, etc. After the advent of the white man, conditions were somewhat changed and the insects found ideal breeding grounds in the trees girdled by the settler in clearing the land, in the trees cut in clearing rights of way for railroads, wagon roads, trails, light and power lines and in the immense amount of slash,



ABOVE: Pine timber killed and fire trap created by western pine beetle in  
Klamath county.  
BELOW: Barking process in beetle control operation. Note egg galleries.

tops, stumps, broken and cull logs and damaged trees which resulted from logging operations. The debris resulting from these operations was allowed to remain on the forest floor, with the result that the insects attacked it and with the added food supply multiplied rapidly. In time the insects were too numerous to be accommodated by the amount of refuse in the forest and they were forced to attack healthy timber. In cases where only a few pair of beetles attack a healthy tree, the attack usually fails, the tree protecting itself by the flow of sap in the mines, drowning the insects. Where the attack is launched by thousands of individual insects, the tree is unable to overcome them and the attack is successful from sheer force of numbers.

"When the beetles become abundant and kill large numbers of trees, the infestation is known as an epidemic. These epidemic infestations usually run in cycles. Starting from the normal infestation (where less than one-tenth of one per cent of the timber is attacked) they increase in severity from year to year for a matter of four to six years, then gradually decrease to normal again." (See page 36.)

Instances have been reported where as much as ten per cent of a given tract of timber has been destroyed in a period of four years, resulting in an irreparable loss to the owner and to the community.

It has been thoroughly demonstrated by the Klamath-Lake Counties Forest Fire Association that these depredations can be controlled and this association has since 1911 been doing control work on a limited area, but the method used—that of cutting, peeling and burning the bark of infested trees—is a slow and expensive operation and what is most needed now is to find a simpler and more effective method.

The title to our pine lands is held by individuals, copartnerships, corporations, the state and the federal government, and the acreage vested runs from the little tract of forty acres to the great bodies under federal control. These ownerships are more or less intermingled. The beetle is gregarious and observes no boundary lines. The owner willing to exterminate this pest in his timber should be protected by law from his neighbor who is indifferent or unwilling.

The federal government by virtue of administration of its national forests, Indian reservations, public lands and O. & C. lands is the largest owner and the most culpable. It has knowledge of the situation but very little money appropriated for work. It is losing millions of feet annually through neglect.

The present method of fighting the beetle is crude and expensive. Practically no improvement has been devised since the first control work was started. Private owners cannot afford to conduct experiments. This is purely a state and government function.

It would seem then that our duty is (1) to require all owners of beetle infested timber to control the same under the direction of the State Forester with a suitable appropriation for this purpose, and (2) that the Forestry Department of O. A. C. be provided with sufficient funds to make a study of better methods of control work, and (3) that congress should be urged to make a special appropriation for the Forest Service to be expended in immediate actual control work.

## THE FUTURE OF THE LUMBER INDUSTRY IN OREGON

It is evident to every thinking citizen that the forests of Oregon constitute one of the state's richest natural endowments. During the past few years the industry has caused an annual circulation of more than \$75,000,000.00 through the arteries of trade within the state. This vast flow of capital marks all stages of lumber manufacture, from the stump to the finished product. The industry in its various branches has given employment to approximately 40,000 workers. The future of an industry of this magnitude is a matter of keen interest to every citizen. If this industry can, like agriculture, be placed upon a permanent basis, yielding approximate annual incomes, a great service will have been rendered the state and the nation.

For the next twenty-five to forty years it is certain there will be a great increase in lumber production in Oregon. The Lake States have been cut out. The South is past its peak of production. The national lumber requirements, about forty billion feet, board measure, annually, are being, in increasing amounts, exacted from the Pacific Northwest. Some of the strongest operating concerns in the United States, and especially in the South, have been quietly accumulating vast stumpage holdings in this region. To them the logic of events is clear. Here is the last great reservoir of virgin timber. Mature timber in appreciable quantities cannot be produced before the present stand is exhausted. Their financial interests evidently dictate that they should be firmly intrenched here before sharp advances in stumpage prices occur. This substantial expression of confidence in the immediate future of the lumber industry, together with the known shortage of stumpage supplies elsewhere, should be sufficient to indicate that there will be marked activity in lumber manufacture in this region.

In other regions, the lumber industry has brought great temporary prosperity and then, with vanishing stumpage, has left desolation and ruin. This need not be the story of the industry in this state. The federal government has, within control of the Forest Service, thirteen million acres of forest land in this state. At the most conservative estimate, private owners hold sufficient acreage to make, within the borders of the state, 20,000,000 acres of land suited only to timber production. This area, under proper management, can be made to yield, annually, timber with a manufactured value in excess of \$150,000,000.00, and to furnish permanent employment to 80,000 workers.

To bring this result to pass will require the exercise, by the citizenship of today, of a high type of patriotism, material sacrifices for the future state and for the future generations. The program is simple and the responsibility seems clear. It means that every potential forest acre in the state should be put to growing timber. It means that forest fires, in standing timber and in young growth, must be eliminated. It means putting into operation a well thought out, definite forest policy, so organized and so timed that, ultimately, approximately equal amounts of stumpage will annually be ready for the axe and the saw. This is not a visionary probability; it is a hard, cold business proposition. He who would serve his state should give the matter consideration. It is not an unpleasant thought that the people of this generation have it in their

power to insure the maintenance of forest crops in this beautiful Oregon country, and that, through them, a hundred years hence, the woodman's axe and the woodman's saw will, as today, contribute to the happiness and prosperity of thousands of homes.

### FOREST FIRE PROBLEMS IN OREGON

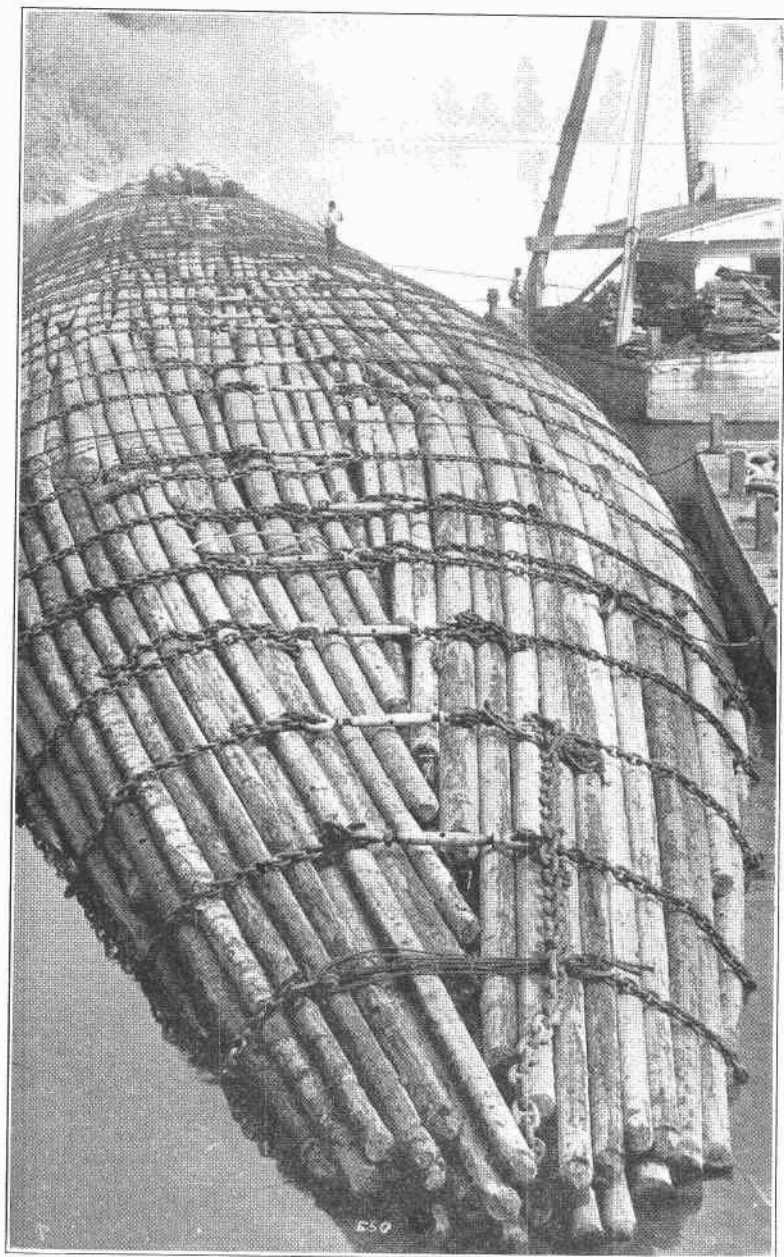
An enumeration of all the fire problems in the state would make a very long list. The more serious ones are not numerous. Fires are generally broadly classified as (a) those resulting from acts of God, (b) man-caused fires. While both of these classes have to be reckoned with, prevention measures necessarily deal largely with man-caused fires. Any reduction in the number of this latter class can properly be reckoned a distinct achievement.

#### LIGHTNING FIRES

The bulk of fires which start through causes which cannot be controlled are from lightning. The number of these vary greatly different years. For instance during 1919, a very bad year, 181 lightning fires are of record out of a total of 1,144 fires, while in 1920, a comparatively favorable year, 123 lightning fires occurred in Oregon out of 809, or about the same percentage as during 1919, although the percentage of such fires in most northwestern states the past season was unusually high. One of the main difficulties with this class of fire is that they start in remote places and from a few to hundreds may start at about the same time. Ordinarily they are small fires, which, if promptly attended, cause no serious damage, but occasionally conditions are such that they spread rapidly and become serious fires even when prompt action is taken. The only solution for lightning fires is good lookout or detection service and prompt attention. Given these two things, few of them will do serious damage.

#### MAN-CAUSED FIRES

Under this class the most usual fires originate from logging operations, railroads, land clearers, highway builders, hunters, fishermen, campers, and incendiaries. In all but the latter class they are caused through accident or carelessness. It is man-caused fires with which protection agencies are principally concerned and against which their campaigns of education are directed. In the case of the incendiary, the object is to bring him to justice, but the very conditions under which he commits his crime makes detection difficult and often impossible. In the case of fires resulting from carelessness, fines often result, but more often cost of putting out a fire is the only punishment meted out. Laws governing use of fire are generally adequate in Oregon. Engines operating in wooded sections from June 1 to October 1 must have efficient spark-arresters. Loggers must annually burn their slashings, road builders are required to dispose of refuse resulting from construction work, and no fires other than those to burn piled debris may be started without permit from a warden. If all of the laws were strictly observed there would be comparatively few man-caused fires. But the trouble is



AN OREGON SEA-GOING LOG RAFT



they are not observed, and to bring about proper observance is the gravest problem faced by the state and protection agencies cooperating therewith.

#### PROTECTION SYSTEM

All of the timbered portion of the state is now patrolled for fire during the danger season. In some sections resources are better guarded than in others, in some organizations are efficient and in others relatively inefficient, but the standard of protection work is each year improving. Detection of fires is no longer our greatest problem. Through lookout systems and the air patrol few fires burn more than a few hours without discovery. Control is not as efficient as detection and is very apt to break down during the worst part of the season if a large number of fires become started. It must be remembered that the very dangerous part of the fire season is seldom over two months long. Some years it may be two and one-half months, others six weeks. Forest protection agencies are organized for the normal year and depend upon adding short time men to their forces when conditions become serious. During seasons of unusual hazard it generally happens that numerous bad fires become started before the contemplated expansion in force can take place, with the result that the regular force becomes too thinly spread out to be most effective. It is true also that the worst part of the fire season comes at a time when local help is hard to secure, due to harvest and other activities. When large numbers of inexperienced men are assembled at fires without an adequate number of experienced ones to direct their efforts, much waste effort and consequent expense is sure to be the result.

The answer to this problem is doubtless that protection organizations must early be prepared for more than the normal year. While such action means greater patrol and improvement expense every year than has been the practice, it should mean smaller fire fighting bills during bad years, and in the long run the plan will prove an economy.

At present bad years result in greater expense for fighting fire than for all other projects. A more adequate force—one which can unaided handle most fires—should keep down fire fighting expense the bad years, avoid loss of timber and over a period of years show a financial gain over present protection methods. This is coming to be an accepted fact. Fire fighting crews, kept at improvement work when not otherwise needed, are maintained by some organizations in addition to the regular lookout and patrol force. Camp wardens in logging operations is another safeguard being very generally thrown around such operations. The use of motor transportation in most sections has made possible movement of men and equipment to fires in much shorter time than was possible a few years back. Light trucks which can be cheaply operated are a boon to protection work and should be in much more general use than at present.

#### MORE INTENSIVE ORGANIZATION AND LAW ENFORCEMENT THE ANSWER

From the foregoing discussion we arrive at the conclusion that two main things are needed to make protection more efficient:

1. Organization on the part of protection agencies to cope with at least a reasonably bad year. This includes extension of patrol to all

forest lands and substantial state and federal aid to make such extension possible.

2. Strict law enforcement by fire wardens without regard for individuals affected. If all get the same treatment then at least no operator or other citizen is subjected to expense which his neighbor doesn't also have to bear.

Law enforcement will remove a large part of the slashing menace, will control the small fires which burn around settlements on the edge of timber belts and sometimes escape, will make autoists, campers, hunters and operators more careful and consequently reduce the number of man-caused fires.

Present tendencies are in this direction. They, however, need speeding up. Federal help to states and more adequate state appropriations will go a long way toward putting in effect an efficient and comprehensive plan of protection.

### INTRODUCTORY STATEMENT TO A FOREST POLICY FOR OREGON

More than any other state in the Union, Oregon's prosperity is dependent upon her lumber industry. The state has a comparatively small population and a limited industrial development. It has large areas of undeveloped agricultural land and larger areas of land fit only for growing timber crops. Aside from agriculture, the lumber industry now constitutes the one large field for labor and source of income for residents of the state.

With the passing of the lumber industry in any section—and some sections of the state can now plainly see the end of their timber supply—must inevitably come heavier burden of taxes on farm land, city and town property, a decrease in population and waning prosperity. The biggest problem now confronting the state is how to perpetuate its one big manufacturing industry, keep producing the largest possible percentage of our lands and as a consequence, to make sure that they are able properly to share in the tax burden.

The answer to this problem unquestionably is that trees must be grown to take the place of those removed. This will automatically insure a great lumber industry for all time. But, though favored above any section of the United States with soil and climate peculiarly adapted to the rapid growing of timber crops, the replacement of forests is not a simple matter. As a state, we are following no definite policy with this end in view, nor has the nation any definite forest policy except for those lands in government ownership.

Need for a definite forest policy, both national and state, must be obvious to every thinking individual. The Oregon State Board of Forestry believes the time has arrived when its duty to the state demands that it should point out with considerable emphasis not only some of the things it thinks should be done in this commonwealth, but to urge that a consistent national policy be formulated and put into execution.

#### *National Interest in Forest Protection and Perpetuation*

Just as the state's obligation must extend to every county within its limits, so must government interest embrace every state in the Union.

Oregon's first interest is in seeing that its residents are assured a plentiful supply of building material at reasonable prices for all time; that industries dependent upon timber can build in the state with assurance of permanence; and that absolute forest land is kept in crop so that it may contribute to the building of roads, the maintenance of state institutions, and to the support of all other proper state and local activities. Secondly, as one in a union of states in a region favored by nature for timber growth, Oregon has an obligation to help grow the nation's timber supply.

The federal government, on the other hand, is interested first in seeing that Oregon grows timber on every acre best suited to such use, in order that there may be produced, in excess of the needs of residents of the state, supplies for distribution to those states having little or no timber. Therefore, it behooves the government to encourage and assist all states in forest replacement. Obviously, this encouragement and assistance should go in the greatest degree to those states which can contribute most to the nation's lumber yard.

Government help, thus far, has taken the form of advice to states and later of very meager financial assistance. It is now proposed by the Secretary of Agriculture materially to increase financial assistance to those states which are themselves maintaining State Forestry Departments and further showing their good faith by expending state funds to increase the protection of their timber resources. The State Board of Forestry regards this first important step in government forest policy a proper one. If the public is to be benefited by having a plentiful supply of cheap timber, then the public must help bear the cost. If provision is not made for a plentiful supply of timber, obviously there can be no cheap timber.

#### *The State and Forest Growing*

Every citizen in the state is vitally interested in the timber and timberland within its borders. Possessing the largest amount of timber of any state in the Union and forming a part of the only region in the United States having a large quantity of the original stand of timber, every economic indication is that there will be a great development in the state's lumber industry in the next ten years. This development will be permanent or temporary in proportion as the state handles wisely or foolishly our forest problems. If, after logging, lands are properly cleaned up by slash burning and otherwise, and fire thereafter kept out, a new forest will be established by natural seeding within a comparatively brief period. If this plan is consistently followed, successive crops of timber will be established and mature timber will be ready for the woodman's axe when the present supply is exhausted. This policy will mean not only a permanent lumber industry but many permanent secondary wood-using industries and permanence of the other lines of business which have grown up and which will expand with the greater production of lumber. It will also mean that timber will permanently be a great source of tax revenue, thus contributing materially to all forms of state and county activity.

It is believed that the state, in addition to lending added assistance in forest protection, should actually enter the field of growing timber. With

immunity from taxes, with full power to protect its property, and with the opportunity of borrowing money at a low interest rate, the state can show a profit in growing timber where private interests might fail. Assuming, too, that private interests should be encouraged to hold certain lands for second crops of timber, it becomes increasingly important that the state should take the leadership in this enterprise. At present, land excellently adapted to reforestation may be secured at a nominal cost. State activities in reforestation should begin with such lands. As an assistance in the initial work, it is quite likely that gifts of land to the state will be made by public spirited citizens. A carefully worked out plan by which the state would accept in trust land well suited to growing forest crops, with option to purchase, retaining when the timber is sold a large part of the returns but paying the owner a certain equity in such returns, is well worthy of careful thought and consideration.

Similarly, in addition to assistance in forest protection, there should be a modification of the present system of taxing privately owned land held for a second crop of timber to encourage reforestation by land owners. This should not, however, be in any way confused with taxation as applied to timber at present merchantable.

#### *Private Responsibility*

Full and continuous forest production of all lands chiefly suitable therefor involves a responsibility on the part of the private owner. Large areas of privately owned land are suited only to the production of timber crops. Men of means owe it as a duty to the state to make every reasonable effort to keep these lands growing forests and so to manage them that they will not be a menace to adjoining lands. Fortunately, natural conditions insure such complete forest reproduction that there is little necessity for artificial encouragement for modification of lumbering practice to secure satisfactory reforestation. It, of course, is not reasonable that any individual or class should bear, uncompensated, burdens of expense or make sacrifices to afford advantages to society as a whole.

Oregon has already pioneered model legislation requiring protection by the owner of all forest land from which fire may spread; the abatement of fire or fire conditions; the disposal of dangerous slashings; precautions in logging operations; and many other restrictions necessary to safeguard forest resources and forest reproduction and to make conditions for the latter more favorable. The cooperation of the lumber industry in such steps has been notable. If experience proves that any further legislative steps are desirable to extend and perfect forest growth and to leave all suitable cut-over lands in good condition for growing trees, such steps should be governed by the following considerations:

- (a) The extent to which these legislative acts permit private forest growing to be profitable and therefore possible.
- (b) The extent to which the community for community good is willing to cooperate in producing timber crops.
- (c) The extent to which there may be a just exercise of police power, on behalf of the industry or of the public, without infringing upon private rights or imposing unreasonable requirements.

## A FOREST POLICY FOR OREGON ADOPTED BY THE OREGON STATE BOARD OF FORESTRY

Realizing the vital importance of the forests and of forest products to the economic welfare of the people of the United States and especially to the people of the State of Oregon, the State Board of Forestry hereby approves the following fundamental principles as indicative of its proper field of activity in assisting in solving national and state forest problems, to the end that forest industries may be perpetuated and extended and that the people of the United States and of this state may for all time have timber supplies adequate for their needs.

### *Federal Activities*

1. The State Board of Forestry recognizes the desirability of maintaining the present national forest under federal control, and believes in the blocking out, with certain limitations, of existing federal forest areas, by purchase or otherwise, of absolute forest land in the interest of more efficient and economical management of existing forests.

National forests administered wholly at government expense must by law annually return 25 per cent of the gross returns from such forests to the state. An additional 10 per cent goes for roads or trails in or adjacent to such forests. It is true that a large area in Oregon is not on the tax roll as a result of the government's national forest policy, and also that present returns from the national forests fall far short of what the lands would return in the form of taxes if they were privately owned. It is reasonable to assume, however, that with the demand for lumber turning in a greater degree to the Pacific Northwest, the state will soon secure substantial revenue from national forests and that under proper management such returns will be sustained from year to year. When that time comes, the forests under federal control will be contributing more of their gross income to the state than any private business could possibly pay in the form of taxes. The federal government is in effect practicing forest management on lands within the state under a plan whereby Oregon participates in the returns from such lands. Had the government desired to come into Oregon and purchase denuded land on the same basis of future returns to the state as is now in effect on national forest areas, it is possible that opposition would not have been encountered. This would have been recognized as a means of keeping productive mountain lands and other absolute forest lands considered of little value once the timber is removed. Furthermore, Oregon could hardly expect to make a profit of 35 per cent on gross returns on the management of such lands.

It is true that vast sums would have been paid the state as taxes on federal forest lands had they gone into private ownership and that, from time to time, there has been some annoyance due to federal regulations and requirements. An understanding by the people of the state of the administrative methods of the Forest Service and a comprehension by the Service of the needs of the state, have largely eliminated opposition to the national forests and national forest policies. The near future gives promise of added financial help to the state from national forest areas. It is conceded that the national forests have come to stay. The part of wisdom is to accept them and to try to make them profitable alike to the government and to the state.

At present receipts from national forests return to the state some \$100,000.00 annually. An appropriation for roads in or partly within national forests has given Oregon about \$300,000.00 annually the past two years. The Chamberlain Bill, recently introduced, will, if passed, more than double the sum above mentioned for road work and thereby and together with receipts from sale of products of national forests, go a long way toward offsetting loss in taxes.

Efficient management of the national forests demands a thorough blocking out of national forest areas. Those forests having within their borders the largest areas of privately owned land are now most expensive to administer. With this understanding there should be no objection to the exchange of government land for that in private ownership or to acquisition by the government of additional absolute forest land in or adjacent to existing forests.

2. The State Board of Forestry believes that congress should make adequate appropriations to insure reasonably rapid forest replacement on all denuded national forest land.

National forest timber is being cut as rapidly as the lumber industry can absorb it. On the bulk of the lands now being cut over within the national forests, a new crop is assured through proper handling of such cutting. This, in both Eastern and Western Oregon, is largely a matter of proper slash disposal. There are, however, considerable areas which, as a result of repeated fires, now bear no young tree growth of value. Such areas must in the interest of the government and state alike be reforested artificially. So far, congress has failed to appropriate necessary funds for this work. What has been done is little more than experimental. The last congress reduced rather than increased funds for reforestation. The longer work of this character is delayed the greater will be the interval before these lands can contribute from their product to the state and to the timber supply of the state and nation. Appropriation of additional funds for the reforestation of denuded national forest lands should be urged upon congress.

3. It is urged that congress make appropriations sufficient in amount adequately to protect all national forest areas from fire and insect depredations.

First of importance in all national forest work is forest protection. Mature timber and that partially mature must be safeguarded. When burned, possibilities of revenue largely cease. Congress has never failed to provide funds with which to fight fire. Such funds have, however, often been in the shape of deficiency appropriations. What is not recognized by congress, but is recognized by private owners and the Forest Service, is that economy in the long run results from providing an adequate force to prevent fire. This may mean slightly greater expense than absolutely necessary during favorable years, but it means less expense during bad years. The important thing is that it means smaller losses of valuable timber. Enormous protection expenses do not result from maintaining an adequate prevention force but through the necessity for an excessive amount of fire fighting. A request for an emergency appropriation is similar to a riot call in an inadequately policed city. The aim should be, in so far as this is possible, to prevent need for fighting large fires which not only entail great expense but also result

in timber losses often aggregating millions. The saneness of recognizing that adequate prevention forces be maintained on national forests should be brought to the attention of congress. The fact that national forest areas join or are intermingled with the lands of the state adds to the nation's responsibility in this particular subject.

Another phase of protection assuming importance in certain sections, is the control of insect depredations. Federal funds for this work have always been far from adequate. Insects are now doing damage computed in thousands of dollars on lands inside and outside national forests. Insect control to be successful must be extensively carried on or it becomes a waste of funds. Partial cleaning up of an area is useless. The need for providing funds so that this work may be properly handled should also be urged on congress.

4. The federal government should provide for a comprehensive inventory of the forest resources and absolute forest lands, including:

- (a) The total supply of merchantable timber.
- (b) The total acreage of immature timber, with the approximate time of its maturity and the estimated yield at maturity.
- (c) The total amount of forest land now unproductive.

It is believed essential and sound from a business standpoint that the nation have an official stock-taking of forest resources, to determine where we stand with regard to available timber supplies; what areas give promise of future production if protected; how soon crops on these areas will be available; and the extent of areas not now restocking and which require special treatment to bring them to a state of production. Data now available covering the items above enumerated are inadequate. The information is little better than a guess. Each state should be able to figure out what percentage of its area must be kept in forest to supply home markets, and what additional area can well be kept in timber crop to support its lumber industries and to supply outside demand. The federal government should have accurate data from which to compute the area in the different sections of the country which should be kept in forest crop to safeguard the future needs of all the states, and it should also be known how nearly present areas of young growth will supply this future demand. In other words, each state for itself and the nation for all the states should be able to arrive at a minimum area to be kept in forest growth below which minimum it would be unsafe to go.

The federal government in cooperation with the state should provide for an examination of all lands concerning which there may be a question of their agricultural value. Lands of present or potential agricultural value should be so designated. Such classification would be of immense value to the state as a basis for considering extension of national forest areas, in making exchanges of state and government lands and in acquisition by the state, when the time arrives, of denuded forest lands to be held as state forests.

5. The State Board urges the maintenance and extension of airplane forest patrol by the War Department, in cooperation with the United States Forest Service.

Air patrol was maintained by the War Department the seasons of 1919 and 1920. Results show it to be a valuable adjunct to the fire detection system.

The airplane work of the 1920 season was far better organized than that of the previous year. Through funds furnished by the state and an appropriation of \$50,000.00 for the use of the Forest Service in cooperating with the Air Service, forest officers were stationed at each base and landing field to receive and transmit reports and to confer with Air Service officers in matters affecting protection work. No patrol was maintained in Eastern Oregon and sufficient planes were not available properly to patrol the western part of the state.

In view of the great value of the standing timber, the large area of national forest land in Oregon and the excellent training afforded aviators engaged in forest patrol, it is felt that the War Department would be justified in continuing to furnish this service. It is maintained at practically no expense to the government which must, under any circumstances, maintain its officers and men and keep machines on hand. The Air Service in patrolling the forests is doing a very useful work. If not so engaged, men and equipment would be kept at practice flights in a country where no immediate good would result. The State Board of Forestry believes that the War Department and Forest Service should not only continue the air patrol another season, but that it should be extended and intensified.

6. It is believed that the federal government should not only continue but extend its experimental work looking to better utilization and handling of forest products. Field experimental stations should also be maintained throughout the west as a means of studying fire, grazing, reforestation and other problems.

The laboratory at Madison, Wisconsin, maintained by the Forest Service, is the only place where wood uses and proper handling of wood is being studied. During the war, this laboratory was of the greatest assistance to the War Department in connection with the Air Service program and in other directions. The laboratory has been of value to the lumber industry and the consuming public alike as well as aiding the conservation of wood products in the interest of the entire nation.

It is now hoped that local problems such as fire prevention, reforestation, effect of grazing on forest lands, control of insects, etc., may be studied through establishment of field experiment stations. Many of our problems must be worked out in an intensive way and just as experiment stations have proven of inestimable value to agricultural interests, so it is believed forest experiment stations will prove of benefit to forest industry and the general public.

7. The United States Weather Bureau has, for the past five years, rendered valuable service in forest protection by forecasting protracted hot spells and dangerous fire winds. This service has not been brought to the highest state of perfection due to inadequacy of funds for conduct of studies aimed at perfection of the work. It is urged that adequate federal appropriation be made for study of methods in forecasting fire weather.

It often happens that advance knowledge of a hot spell or high winds makes possible prevention of many forest fires. If fires are burning, added effort can be made thoroughly to extinguish them. Places of particular hazard can be additionally safeguarded and protection agencies are at least warned that added vigilance is required. Forecasting this



type of weather several days in advance and for localities where local topography is a factor, is not simple. The Weather Bureau has not been furnished the needed personnel and equipment to do the work in an efficient manner. Studies and data for many localities are lacking and must be gathered. This does not mean great expense but a few thousand dollars will, it is believed, return large dividends in added safety to forest areas. The work so far performed has been most valuable. It should and can be made much more efficient if funds are provided.

#### *Federal and State Cooperation*

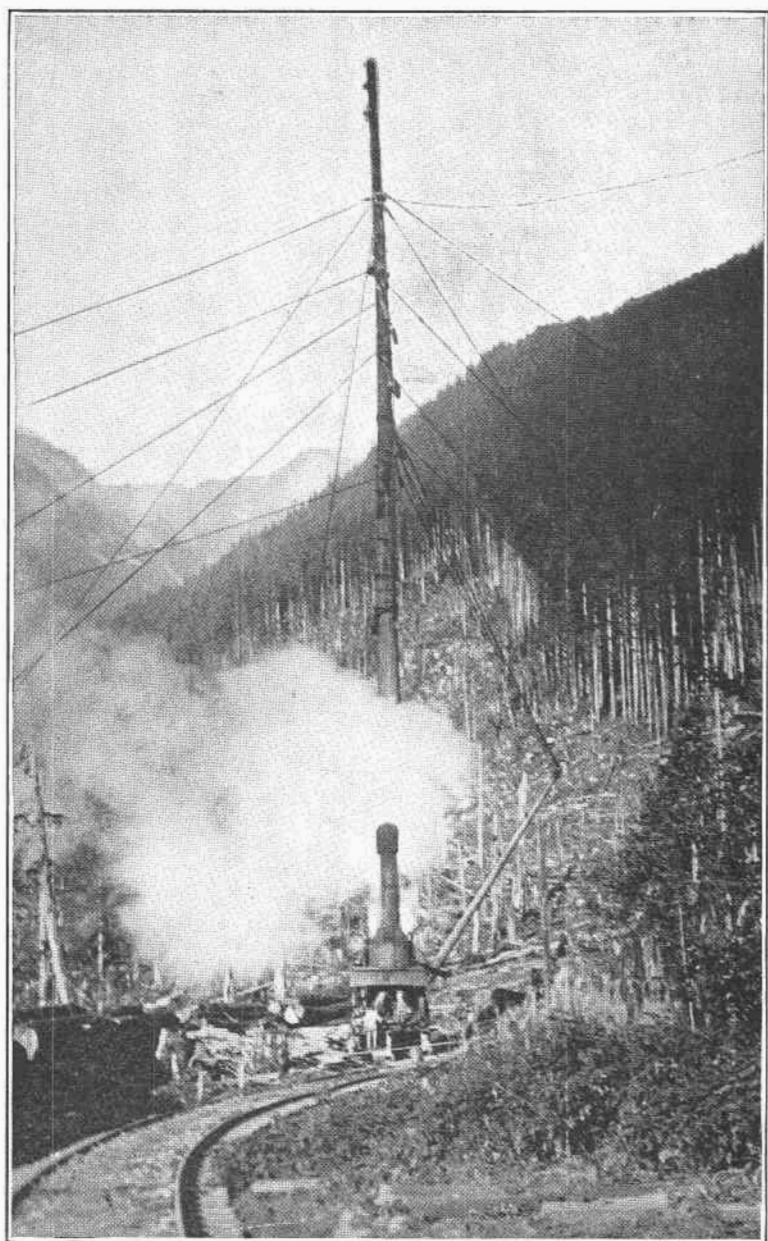
1. Since forests are a national asset and contribute to the welfare of all the people, the State Board of Forestry urges that liberal federal appropriations be made adequate in amount to prevent and control forest fires outside the national forests, such appropriations to be met by equal expenditures within the state.

The government has long recognized the fact that under present economic conditions, the growing of forests for future timber supplies is an uncertain financial venture for private enterprise. The first recognition of this came with the creation of national forests. In some states this government action was followed by the establishment of state forests, in others by laws aimed at safeguarding timber. All of these things have been good but the nation has not yet reached the point where an adequate timber supply for the future is assured. To establish this assurance will require a great extension of national and state forests, or else it will require the enactment of laws which will make it possible for private enterprise to enter the field. A great deal remains to be done before private capital can see in forest growing a profitable investment. In the meantime, lands restocking, young growth and mature timber should be protected in every feasible way. There is the added reason for forest fire protection in that fires annually destroy property of ranchers and settlers to the amount of thousands of dollars as well as taking an annual toll in human life.

The nation is interested in having for all time a plentiful supply of cheap timber. This means that the present forest growth both young and old must be protected. Such protection cannot be logically borne in its entirety by the federal government or by the state or by private owners. All are directly interested and consequently all should help bear the cost. Were merchantable timber in private ownership alone involved, then the question of financial responsibility would be simple, but when the greater problem is protection of cut-over and burned-over areas, potential forest land in a variety of ownership, the need for government and state cooperation in protecting such areas is obvious.

The State Board of Forestry is, therefore, in full accord with the proposal of the Forest Service to ask congress for an appropriation of at least \$1,000,000.00 with which to cooperate with states in forest protection and will urge Oregon's congressional delegation to support this item in the appropriation bill.

2. Funds should be allotted jointly by the federal government and the state for the classification of forest land now outside national forests in order that no land better suited to agriculture than to forestry may be devoted to forest purposes.



SAFETY OF TIMBER AND EQUIPMENT DEPENDS UPON ADEQUACY OF  
SPARK-ARRESTERS

Land classification should go hand in hand with a census of our forest resources. Need for such classification hardly requires argument. Oregon should know, and the government should know, what lands within the state are best adapted to growing forest crops and which eventually will be so utilized. But this work should be done by state and government jointly in order that the data collected may be the basis for future state or government acquisition of land and for state and government cooperation in protection of land in other than public ownership.

3. To facilitate management, there should be in operation a policy of land and stumpage exchange, on the basis of equal values, between the Federal Forest Service, the State of Oregon, and private owners.

If both the state and the government are to be in the field of forest growing, cases will arise where exchanges of land with the government are desirable. It would be greatly to the advantage of the government and private owners alike if exchanges of privately owned land for government land could be made and this on a basis of equal value. At present, the state and the government can only exchange land under an old law which provides a means for states selecting lands in government ownership outside national forests for school sections located within such forests. Many unnecessary steps are involved in making exchanges under this law. A general exchange law should be enacted to provide for blocking out of government, state and private lands. Numerous bills with this end in view have been introduced. None of them have so far become law.

4. The federal government and the state should provide a plan of cooperation through which forest nursery stock may be supplied to farmers, municipalities and other land owners at cost of production.

Many ranchers and some timberland owners will eventually desire to plant trees, the former to secure material for farm purposes, the latter to fill in fail spots on areas being held for a second crop. In the public interest, planting should be encouraged as a means, though a minor one, for providing future supplies of timber. To aid in this project, forest nursery stock should be supplied at a minimum of expense. Since the Federal Forest Service now maintains nurseries in various parts of the West, and since their capacity can be increased to meet additional demands, it seems inadvisable for Oregon, as some other states have done, to establish nurseries for growing tree stock. Better results at less expense can be secured through cooperation with the federal government.

Considerable public interest has recently been aroused in the matter of preserving the scenic beauty of the state's highways. This is a project which may require nursery stock for roadside planting. Since this is in the interest of all the people, cheap stock should be available, but trees should not be furnished for ornamental purposes as the business of growing such trees is already taken care of through private nurseries with which the state has no desire to compete.

5. In the interest of economy and efficiency, a cooperative agreement should be entered into through which the state would have the privilege of purchasing supplies and equipment used in the various branches of forestry work from the Federal Forest Service.

In the administration of the national forests, large quantities of telephone material, tools of various kinds and other equipment must annually be purchased. In so far as this is advisable and under a system of competitive bids, the Department of Agriculture enters into year-long contracts with various firms to supply its needs. This results in securing lower prices for most equipment than can be obtained by the state or protective associations. Since the federal government now cooperates with the state, and presumably will, in the future, cooperate to an even greater extent, it seems logical that the state should have the advantage of purchasing supplies and equipment used in protection work.

### *State Activities*

1. Such legislation should be enacted as will make possible, through cooperation with the federal government and by direct state action, that degree of fire prevention and control which will make forest properties an insurable risk. The State Board of Forestry regards fire prevention and control of fundamental importance in any forestry program for this state. Fire protection should be extended to all potential forest land as well as those lands now carrying mature or immature timber crops.

It is the duty of the state so to manage its natural resources that they will contribute to the prosperity and happiness of its citizens in the greatest degree and for the longest possible time. The forests of Oregon constitute one of the state's richest natural endowments. It is estimated that more than \$75,000,000.00 annually circulate through the arteries of trade in the state on account of the lumber industry. More than forty thousand workers find employment in some branch of the industry. Fire is by far the greatest menace to the existing timber supply and to young growth, which is the basis of the future forests and of the future lumber industry. Satisfactory natural reproduction follows logging on the greater portion of the territory west of the Cascades. Prevention and control of fires insures future forests. Forest fires can be controlled. It is the plain duty of the state to make adequate provision for controlling them. The minimum appropriation for the use of the State Board of Forestry for the coming biennium should be \$170,000.00. The state should be prepared to match dollar for dollar federal appropriations made for protection purposes. Under present federal plans, Oregon should be entitled to federal assistance aggregating \$85,000.00 annually.

2. The State of Oregon should enter on a program of acquisition by purchase, gift, bequest or acceptance in trust, of logged-off or other absolute forest land.

Thousands of acres of logged-off lands, suited only to producing timber crops, are now lying unproductive, a burden to the owners because of this condition, and a source of little tax revenue to the state because of their evident low value. Under present economic conditions and because of a lack of understanding of forestry methods as well, owners of logged-off land do not feel justified in making such investments as will insure a stand of timber on these lands. A responsibility rests upon the state to put these unproductive acres at work in order that their product may carry on the lumber industry of another generation when the present stand of timber has vanished before the axe and saw. A well thought-out program of acquisition and reforestation of cut-over

and otherwise denuded lands should be developed. This program should be made to harmonize with federal activities along the same line but should be on a scale which will insure bringing all absolute non-forested lands under forest within a period of forty years. As a part of the general program of reforestation, it is believed that a plan can be devised which will prove sufficiently attractive to owners of large areas of logged-off land that they will desire to create estates for their descendants by conveying these lands in trust to the state for reforestation purposes. Costs to the state for actual expenditures, for interest and for risk, could be made to constitute a lien upon the property, to be satisfied at the time of the harvesting of the timber crop.

3. The State Board of Forestry commits itself to an aggressive campaign of education, by publications, lectures, demonstrations and otherwise, to the end that the people of the state may be fully informed concerning the value and extent of its forest resources, the damage done to immature and mature forests by fire, together with the means which should be employed to bring about the full and continued utilization of forest lands within the state, and to insure the full protection and wise use of the state's existing timber supplies.

In the last analysis, in matters within the province of the state government, the people of the state decide what policies shall be adopted and what lines of action shall be followed. Intelligent decision and wise action can follow only after the electorate is possessed of full information. When the people of the state know the extent and value of its forest resources, when they are advised concerning the amount of damage done to standing timber and young growth by forest fires, when they are impressed with the economic advantages to the state of fire prevention and control and when they have had demonstrated to them the feasibility of replacing forests on cut-over lands, then the future of the forest industry in Oregon is assured. It is the duty of the State Board of Forestry to see to it that this information is placed in the hands of the present voters and of the children, the future rulers of the state.

4. Systematic and continued investigations of insect depredations should be provided for, in order that feasible means may be discovered for minimizing timber losses through this agency.

The problem of controlling the attacks of forest insects has not been solved. Its solution is a matter of vital importance to the timber owners of certain sections of the state. Economically, the problem is of importance to the entire state. Funds should be provided, commensurate with the property interests involved, so that field experiment stations may be established and experts employed properly to carry on the investigative work of forest insect control. Timber destroyed by insects, no less than timber destroyed by fire, is an economic loss to the commonwealth.

5. There should be created a commission authorized to investigate and report upon the whole question of the taxation of forest lands devoted to the reproduction of forest crops, and of these crops during the period between establishment and maturity.

It is an economic axiom that income establishes values and that taxes should be levied at the time incomes are received. Forest crops differ from other crops in that they mature only at long intervals. These

intervals vary from fifty to one hundred years or more from seeding time. Obviously, to tax the timber producer annually on a value established by a prospective income, due fifty years or more in the future, places him at a decided economic disadvantage with the producer of other crops which mature and are harvested within a season. On the other hand, it is evident that the sudden removal of large tracts of land from the tax roll would place communities at a disadvantage in the maintenance and development of their proper public activities and projects. To deal justly with those political units which have planned their future development upon the tax income from the properties within their limits and to devise a tax system for timber producers which will defer the major portion of the tax until the time of the receipt of income, will require a careful investigation and study by men especially fitted for this task. This task must be accomplished, however, if private enterprise is to play the part it should in the great program of keeping Oregon acres growing the crops they are best fitted by nature to produce. A non-political commission, created by the legislature, should be charged with this duty. They should serve without pay but should have a moderate allowance for necessary expenses.

6. There should be a definite program of assistance to woodlot owners and to those who desire to establish forest plantations for farm use, for commercial timber production, or for beautifying the public highways.

The farmer's woodlot is no insignificant factor in the nation's timber supply. The farmers of the East have learned the woodlot's value. The rancher of this state should know the possibilities which lie within a few acres devoted to timber production before it is too late. It is a proper function of the state to give advice to farmers relative to the management of these little forests. In much of Western Oregon simple methods of management will result in keeping these properties up to their maximum degree of productiveness. The state would also be justified in supplying at cost, forest nursery stock to those who desire to increase the productiveness of present woodlots by planting trees better suited to the various localities or to those who wish to establish new plantations.

7. The state should extend every reasonable encouragement and advice to the establishment of municipal forests for the protection of watersheds valuable to towns and cities in maintaining their water supply.

Many Oregon cities derive their supply of water for domestic use from forested areas. In the majority of cases, this land is privately owned. In many instances private owners are cutting the timber and as a result, the quality of the water is lowered and the efficiency of the watershed is reduced by the lessened stream flow at the period of greatest need. The federal government has recognized the value of a forest cover on a city watershed, notably in the case of Portland. Bull Run water has acquired fame throughout the nation. In a lesser degree, the government has assisted cities in maintaining a forest cover on the areas from which this water is obtained in the cases of Dallas, Corvallis, and McMinnville, where tracts of the O. & C. Railroad grant lands have been set aside for municipal purposes. These are small beginnings. Before it is too late, Oregon cities having possibilities of securing water supplies from forested areas should be fully impressed with the desirability of safe-

guarding those tracts by purchase. They should be advised by the office of the State Forester or by the School of Forestry at O. A. C., or both, relative to the areas required and the methods of management after acquisition. A general state law, giving cities the right to condemn and purchase lands needed for watershed purposes, should be enacted. European cities derive revenues from their municipal forests far in excess of the costs of management. In addition, they have the benefits coming from a safeguarded water supply. Certain Oregon cities should own and manage forests on their watersheds. Every year of delay means added investments.

8. Since Oregon leads all other states in the extent of its timber resources and since the state has within its borders absolute forest land sufficient in amount to enable it to maintain this position of supremacy, the State Board of Forestry believes it will be doing a real service to the state in striving to maintain this position of leadership both by advocating the policies indicated above as well as in advocating other lines of activity when such shall appear desirable.

### RECOMMENDATIONS

The state forest policy as published in this report contains, among other things, a list of activities which the State Board of Forestry, upon the adoption of the policy, pledged itself to support. These activities may be regarded as recommendations in themselves and are very briefly outlined as follows:

1. Action in reducing the fire loss on all potential forest land.
2. Acquisition of logged and burned-over land for growing new timber crops.
3. Aggressive educational campaign on value, protection and utilization of the forests.
4. Pine beetle investigations.
5. A committee to investigate taxation on immature timber crops.
6. Assistance to woodlot owners.
7. Encouragement of municipal forests for the protection of watersheds.
8. Maintaining the state's position of leadership in forest protection work.

The extent to which these principles will be applied will depend largely upon the tools given the State Forester by the legislature to work with. Given an adequate appropriation and the new forest policy as a definite working plan, this state will be in position to meet all its responsibilities in the protection and growing of timber for the utilization of its citizens of today and of tomorrow.

Forest fire prevention and control continues to be regarded of primary importance. The appropriation made by the 1919 legislature has barely proven sufficient to meet the actual costs of administration. It is recommended that the appropriation be increased to meet the needs of the department as outlined in the state budget.

Legislative action is recommended amending Section 2, Chapter 247, Laws of Oregon for 1913. The statutory maximum of five cents per

acre collectible by the State Forester for forest protection is not proving equitable. The law should be amended making the actual expenditures the factor for determining the rate of protection.

The continuance of airplane forest patrol by the War Department in cooperation with the State and Federal Forest Services is urged for the 1921 season.

Need of more intensive inspection of field work is urgent. In this connection, there should be made a greater effort in bringing fire law violators to justice and a more rigid enforcement of the slash disposal section of the forest law. In order that these results may be obtained, funds should be provided for the placing of an adequate number of inspectors in the field during the fire season.

The salaries of the State Forester and the Deputy State Forester should be materially increased. These salaries remain the same as in 1911, at which time they were fixed by law upon the enactment of the original forest code.

## STATEMENT OF APPROPRIATIONS AND EXPENDITURES

Expenditures from the appropriation of \$54,000.00, by the Thirtieth Legislative Assembly, from January 1, 1920, to December 31, 1920, inclusive.

Balance of appropriation unexpended December 31, 1919.....\$ 26,247.11

### EXPENDITURES

#### State Board of Forestry:

Expenses of members in attending meetings.....\$ 221.30  
Salary of State Forester.....3,000.00

#### Office Expenditures:

Salaries of stenographers and clerks.....\$ 1,643.48  
Furniture and fixtures .....11.25  
Office supplies and forms .....392.72  
Miscellaneous .....159.41  
\$ 2,206.86

#### Field Expenditures:

Expenses of State Forester and Assistant.....895.06  
Salaries and expenses of District Wardens....17,937.78  
Stationery, stamps and printing.....1,057.24  
Expressage, telephone and telegraph.....186.94  
Airplane patrol .....729.52  
Educational .....153.33

Unpaid bills for month of December.....\$20,959.87  
863.85

Deficit December 31, 1920 .....\* 1,004.77

\$27,251.88 \$27,251.88

*From Minutes of Emergency Board Meeting Held June 4, 1920*

\* "In event of exhaustion of appropriation authorized for biennial period 1919-1920, under Chapter 218, General Laws of Oregon for 1919, by reason of employment of a portion of such funds in assisting federal government to maintain air patrol in State of Oregon during summer months, authority would then be granted to create a deficiency in an amount not to exceed \$5,000.00, provided, however, that no such authority be at present granted."

Deficit was not apparent until after the last meeting of the Emergency Board for the biennium.



# STATEMENT OF RECEIPTS AND EXPENDITURES OF PATROL ASSESSMENTS COLLECTED BY STATE FORESTER

From January 1 to December 31, 1920, inclusive, under the provisions  
of Chapter 247, Laws of Oregon for 1913.

## RECEIPTS

Balance from previous report .....	\$ 5,699.56
Assessments collected for season of 1913 .....	496.79
Assessments collected for season of 1914 .....	364.99
Assessments collected for season of 1915 .....	137.30
Assessments collected for season of 1916 .....	556.52
Assessments collected for season of 1917 .....	1,885.33
Assessments collected for season of 1918 .....	8,192.22
Assessments collected for season of 1919 .....	52,004.34
Assessments collected for season of 1920 .....	1,078.09
Reimbursement by United States Forest Service account expenditures under Weeks law .....	99.67
Total .....	\$70,514.81

## EXPENDITURES

Paid fire patrol associations, United States Forest Service and companies or individuals maintaining cooperative patrol for patrol of lands under contract during season of 1913 .....	\$ 383.67
During season of 1914 .....	312.52
During season of 1915 .....	82.74
During season of 1916 .....	288.60
During season of 1917 .....	534.65
During season of 1918 .....	7,891.55
During season of 1919 .....	20,345.44
During season of 1920 .....	109.06
Improvement work in cooperation with United States Forest Service under Weeks law .....	99.67
Spruce corporation district patrol in cooperation with United States Forest Service .....	58.34
Salaries of patrolmen and fire fighting expenses in districts patrolled by state in 1920 .....	12,386.59
Improvement work, equipment and miscellaneous expense in districts patrolled by state in 1920 .....	2,247.08
Clerical work and miscellaneous expenses, State Forester's office, in connection with administration of compulsory patrol law .....	3,976.96
Assessments refunded .....	39.36
Obtaining record of timberland transfers .....	184.07
Total expenditures .....	\$48,940.30
Balance <sup>①</sup> .....	21,574.51
Total .....	\$70,514.81

① Payment for patrol provided by contract not complete on December 31, 1920.

## ROSTER OF DISTRICT WARDENS

Name	Address	County
Ball, W. E.	Toledo	Lincoln
Bowman, J. D.	Bend	Crook, Deschutes and Jefferson
Connor, F. W.	care Dixon's Ranger Station, Spray	Grant, Morrow, Umatilla and Wheeler
Dixon, P. A.	Vernonia	Columbia
Duncan, S. S.	Lebanon	Linn
Eberly, H. J.	care U. S. Forest Service, Medford	Jackson
Ferguson, J. W. Jr.	Molalla	Clackamas and Marion
Fuller, W. V.	Dallas	Polk
Holden, Ward R.	Baker	Baker
Hoxie, C. A.	Grants Pass	Josephine
Lander, W. J.	Roseburg	Douglas
McLean, E. W.	Olney	Clatsop
Mendenhall, W. E.	Sheridan	Yamhill and Washington
Ogle, H. H.	Box 143, Klamath Falls	Klamath and Lake
Oglesby, C. V.	Eugene	W. Lane, parts of Benton and Douglas
Russell, L. H.	La Grande	Union
Segersten, A. A.	Box 582, Forest Grove	Tillamook
Skinner, M. J.	Eugene	E. Lane
Thomas, J. M.	North Bend	Coos
Trump, Joner	Promise	Wallowa
White, E. L.	Port Orford	Curry

## ASSISTANT DISTRICT WARDENS

Name	Address	County
Batterson, S. M.	Nehalem	Tillamook
Kyle, Cecil	Gaston	Tillamook
Crouch, Chas.	Coquille	Coos

## ROSTER OF PATROLMEN PAID FROM FEDERAL FUNDS

Name	Address	County
Allen, Percy	Elsie	Clatsop
Ayers, A. A.	Lacomb	Linn
Barr, Wm.	Dryden	Josephine
Barry, Virginia	Bend	Deschutes
Briggs, Maine	Blodgett	Lincoln
Brown, Leland	Hoaglin	Douglas
Carr, George	Dexter	Lane
Chapman, Beach	Camas Valley	Coos
Cluster, Clarence	Eden	Coos
Courtney, B. P.	La Grande	Union
Donnell, Joe	Anchor	Douglas
Hamilton, Wm. H.	Bonanza	Klamath
Kau, A. M.	Walton	Lane
Lewis, Alvin	Linslaw	Lane
Long, Mrs. Calvin	Sheridan	Yamhill
Moore, Elmer	Trail	Jackson
Moore, Wm. L.	Camas Valley	Douglas
North, Edwin B.	Timber	Columbia
Owings, Geo. P.	Rogue River	Jackson
Pickens, Martin	Allegany	Coos
Renfro, A. J.	Winberry	Lane
Roop, F. M.	Vincent	Wallowa
Rutherford, James	Hoff	Clackamas
Rust, C. A.	Blachly	Lane
Sanford, O. A.	Dryden	Josephine
Smith, C. F.	Hugo	Josephine
Stockwell, Tom C.	Dallas	Polk
Talbot, Mabel	Bend	Deschutes
Thomas, H. C.	Sparta	Baker
Vernon, J. H.	Molalla	Clackamas and Marion
Whitcomb, G. E.	Foster	Linn
Wilcox, Ray	Estacada	Clackamas
Woodworth, Edwin	Molalla	Clackamas
Wright, Ed	Glide	Douglas

# ROSTER OF PATROLMEN EMPLOYED UNDER PROVISIONS OF FOREST PATROL LAW

Name	Address	County
Baker, E. J.	Port Orford	Curry
Blalock, N. H.	Leland	Josephine
Branson, William	Parkers Mill	Morrow
Brophy, James	Eagle Point	Jackson
Brown, H. B.	Fossil	Wheeler
Combs, Arthur	Black Butte	Lane
Edmondson, Chas.	Butte Falls	Jackson
Estell, Sherman	Rogue River	Jackson
Harmon, John	Dryden	Josephine
Hill, R. W.	Gold Beach	Curry
Hoxie, James B.	Grants Pass	Josephine
Kershaw, J. L.	Wellen	Jackson
Kincaid, John	Williams	Josephine
Lowd, Philip	Medford	Jackson
Mascall, N. H.	Dayville	Grant
Meengs, Ray	Ukiah	Umatilla
Miller, Walton F.	Wedderburn	Curry
Mitchell, Merrill	Beagle	Jackson
Moore, O. L.	Wolfcreek	Josephine
Oden, Rube	Wimer	Jackson
Owings, Annie R.	Rogue River	Jackson
Peterson, Fred	Ukiah	Umatilla
Pierce, J. O.	Gold Hill	Jackson
Potter, George	Richmond	Wheeler
Sanford, Mrs. F. F.	Dryden	Josephine
Smith, Mrs. C. F.	Hugo	Josephine
Sowell, R. G.	Holland	Josephine
Spangler, Thos. G.	Prospect	Jackson
Wright, J. V.	Ashland	Jackson