RECLAMATION AND SALVAGE OF TIMBER LANDS

(TILLMOOK BURN)

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PROPOSED PLAN

1. Cooperative plan to salvage-transportation facilities.

2. Board of Directors or representivies of each group to represent the entire area, set out rules, others to abide by. Cooperative association Corporation.

3. Directors to be elected at an organization meeting of owners.

4. The margin of profit of sale price of logs over their cost during each years operation will be divided amoung those whose timber has been cut that year, according to scale; in making settlement allowance will be made for unpaid accrued taxes, which the corporation may have to pay. Some of the timber may never be reached before it becomes worthless and receiving no income therefrom.

5. Functions of the board:

a. Hire competent logging engineers, cruisers, office force, attorneys etc.

b. Contact for the use of existing private transportaion lines.

c. Build logging roads

d, Build truck roads.

e. Develop rafting and boom facilities

f. Contract for and supervise logging.

g. Contract for sale of logs.

h. Borrow money from the government to carry out the plan.

i. Log most profitable area first. Green timber will not be cut.

NECESSITIES TO FACILITATE THIS PROGRAM

1. Forestalling small scale salvage plans.

2. Agreement of loggers not to cut the green areas.

3. Suspension of all classes of government regulations thus allowing immediate harvest and sale of the salvaged timber.

4. Agreement of nearby mills to utelize the salvaged logs in preference ot their own.

5. Obtaining concession on common greight carriers and forcing completions of connections not yet made.

6. Loan from the Reconstruction Finance Corporation.

7. C. C. C. labor used for building the roads.

8. Opening up several fronts on burned area.

9. Prompt action and speed needed.

REVISIONS RECCOMMENDED FOR THE PROPOSED PLAN

In any salvage work it is impossible and rather unwise and unprofitable to attempt to salvage the entire area in mind, even immediately proceeding to carry out a devised plan of salvage. The most valuable timber will and must be reached first, although consideration must be given to location, whether the timber be of first grade or it be of second grade. With this thought in mind, and giving consideration to the cooperative plan of salvage, it is first necessary for each individual company involved in salvaging a timbered area, to determine whether his particular share of timber will be included or excluded when it comes time for removal. It would be unjust for a concern to invest in a cooperative plan of salvage with the idea that he might receive a return from his investment and then have it fail to materialize. This item can be eliminated by a thorough reconnaissance of the entire area with respect to railroad location-truck-roads-topography of the country-logging shows-quality of the timber and species, also the severness of the burn. If the concern thus discovers that his timber holdings will not be included in the salvage, he had best either upon his own expense, try to link his private attempts of salvaging his timber with the cooperative plan or else forget about

ever having that timber.

DEFINITE REVISIONS:

1. Hire competent logging engineers to locate the logging roads, only a main line road, with the idea in mind to try and construct this road with the highest advantage for each timber holder in respect to location.

2. Cooperatively share this expense

3. The actual logging and expenses to be borne by the individual companies-that is getting the timber from the woods to the main lime road.

4. All concerned to agree on the proposed location of the road.

5. Operating expenses and maintaining the main line and all milling operations to be borne by the cooperation.

6. Determine the cost per thousand for milling thus determining the cost each private owner is to pay for his logs, with respect to sawing and milling.

7. Marketing to be on a cooperative pooling basis.

8. Each owner is to make his salvage work the major operation, cutting down on the output of their output of other logging and milling operations. Thus to abide by the N. R. A. Lumber Code in respect to lumber output.

9. Reforestation plans to be drawn up by the co-operation and the individual concerns compelled to follow them out as rapidly as the timber is removed.

DEFINITIONS

Reclamation must not be thought of as simply rebuilding of the forest soil to establish a going concern, but consideration must be given to already going concerns or to standing mature timber. It is necessary to revalue the timber holdings as a result of economic changes, market fluctuations, distance to markets, thus we find these items making it necessary to revalue the timber lands. It is inaccurate to base computations on past valuations of timber lands.

SALVAGE

Salvage <u>must</u> mean saving, conditional saving, not necessarily saving the entire product of the forest, but saving what can be profitably and economically secured. Salvage is a result of obtaining the maximum return from the land as a result of some abnormal condition.

PART TWO

Salvaging and reclamation must not be confined to destroyed or partially destroyed timber and lands, but to our present matured and unripe timbered areas. At this time of our economical history, and forest history there exists just enough timber to be reclaimed and saved from the devastating fires, ravaging insects, and destructive logging practices to instigate sustained yield of our forests throughout the entire United States.

The time element is the main source of consideration when handling lands of forests for immediate salvage. Give thought and consideration to the reasons why the forests are in such a state of deterioation. Was the timber fire-killed, insect killed, or fungus destroyed. Whether the condition involves each separately or the three factors combined, each item of destruction must be handled as a unit, since time and expense is involved.

With fire killed timber immediate salvage will entirely eliminate the other two sources of destruction-rot and insects-for the time being. Thus you have saved money and made money, since you have thus reduced the costs of logging and milling the fire-killed timber. The fire has already done its damage.

But this is not the case when it comes to insect devastation whether the insect ravages follow the fire or precede the fire. The insects multiply faster than can be economically controlled by any other means than salvaging. Their work has only started when the insects once become lodged within the forest. The same is true with fungus resulting in rot. There is no limit to fungus infestation once it starts, only until all the food which is the tree itself is gone.

In timbered lands we are not concerned with fire as an immediate cause for salvage. The thought in this case is not salvaging the individual tree or trees for economic use but it is the removal of diseased trees so that the surrounding forests are saved from the same fate. Rot and insect infestation should be handled in the same manner as described for fire. Salvaging insect and rot infested trees is not profitable whether the stand is just newly infected or has been diseased for some time. In the former case it is unprofitable to remove individual infected trees for profit in themselves and in thelater case the stand is so far gone that it would bot pay to salvage the remaining timber. Then the objective is salvaging indirectly the standing timber by removal of the infected tree.

DENUDED LAND

These lands are also potential forest lands, lands that are not fit for agriculture purposes. These are salvaged directly by preventing erosion of the soil and regulation of the grazing facilities. We are not yet concerned with forest possibilities. Salvaging is not done for a single peason or benefit. After all a profit, perhaps not immediate, but a future gain must be considered. It may be necessary to make a long time investment by salvaging timber at a loss that later the land will be productive. So we must not base all salvaging calculations on the present.

LOGGED LANDS

Reclaiming and salvaging logged-off lands is not necessarily for profit either--that is relogging, but for immediate improvement of the land itself and to protect neighboring forest areas against fire, insects, and rot. Logged-off land is a sore spot as far as forest land is concerned. Here disease and fungus growth harbors and rapidly develops and eventially spreads to the adjoining tracts of standing timber. Fire can start at the least prevocation. Logged land in relation to fire is as a great patch of tinder ready to be ignited with the least spark of fire.

RECONNAISSANCE OF LANDS TO BE SALVAGED

The steps of reconnaissance were outlined on a previous page and these are the steps which should be pursued that the ultimate objective will be successful. Reconnaissance of forest lands discloses the fact as to future possibilities, not only to the removing of the timber but as to whether the land and forest in question is really suited for timber land, agriculture land or for recreational purposes. Rate of deterioation of the various species of timber can of course be attained by applying periodical cruises to the corresponding species in question, but is it not foolish to sacrafice so much potential timber for the sake of a few accurate tables on deterioation. This problem can be worked out mechanically without so great a loss. Sacraficing for the sake of science is not always wise., much less profitable. There will be sufficient remaining unsalvaged timber standing and fallen on which to practice and make observations. This area of timber can most certainly be located long before the logging starts, since it is not possible to profitably salvage all the damaged timber. As we already know the rate of deterioation as observed in other localities, we simply have to apply this information to the newly destroyed area.

A cruise used in calculating the amount of timber is of little use unless the cruise figures are applied immediately for computing the costs and profits, approximately, to the proposed operation. This is particularly true to damaged or killed timber areas, because of the rapidity which fungus and insects set in, thus increasing the rot percentage and decreasing the amount of merchantable timber. The expense of and cost of a salvaging operation increases directly proportional to the lapse of time between the cessation of a fire or blow-down until the salvaging operation is under way. The reasons for this are numerous. Let us take the handling of logs for example, that is the actual logging, in case all the timber to salvaged is horizontal; of course there has been no definite system of falling as to facilitate the bucking, the trees are lying in a jumbled mass. The trees are cross-wise and broken, cracked and burned, thus making it difficult for the cross-cutters to efficiently buck the trees into logs. They either must be paid an hourly wage above the average scale, or an increased per thousand scale thus compensating the bucker for the slow inefficient work performed. In case of a fire salvage in which the majority of the trees have been killed but remain standing, the

fallers are confronted with the problem of more difficult falling. It is well known that a dead tree resists a saw terrible. The sap has receded to the lower reaches of the tree, and there you have a sticking saw to contend with. In scaling of salvage timber, it taxes the best and most competent scalers to approximately reach a scale which will check with the check scalers talley. Fire scars, rot, blue stain, etc., must be scaled out. A gross area approximation placed high could be of more benefit to the salvaging company. It is an old rule of thumb that the greater the rot the more difficult it is to determine correctly the amount of merchantable timber in a log. In cruising the same condition must be met. Our present high speed,devastating, logging methods break plenty of timber, but how much easier does a rotten log break than a sound one. It is almost impossible to bring to the landing in one piece a log that has rotted to any degree at all. In loading, the same condition is confronted. The tongs pull out and the danger to the logger is greatly increased. The major expenxe or additional cost in dealing with salvaged timber lies in the milling and grading. Here is where the company begins to realize just about what the price of their lumber must sell for and if the whole thing is going to be

profitable. This extra handling and grading and sorting calls for more loss of time and expense in that long process of from the woods to the mill to the finished product. More delay means more expense. Perhaps a new system of grading will have to be devised in order to comply with this inferior grade of timber. More storage space must be found as the salvage timber will not be confused with the normal lumber. Markets must be found for the new grades. Last of all there is an enormous increase in the amount of waste to contend with--perhaps it means the installation larger and more expensive equipment to dispose of this waste. Even in the woods there is that extra waste material that must be disposed of. The output per mill unit is greatly diminished in the case of handling or sawing salvage timber. Is it not true that it takes nearly as much power to saw a rotten log as it does a sound log? Conclusively the company cannot place upon the market lumber from salvaged logs at a price to compete with lumber from normal logs. So arises the question: what price must lumber sold for? Upon making a study of this problem the ultimate and prime question is how many man hours will be required to complete the salvage of the entire area. Simply applying the deterioation

we have the answer to the question as to how much can be salvaged thus the cost of labor and depriciation of equipment. By studying the cruise and scale reports you have the entire salvage picture at a glance.

SETTING UP THE LOGGING OPERATION

In connection with salvaging there has been one question disputed with considerable pressure. Shall the salvaging be in conjunction with the major logging operation? By all means no! Time is of first importance in salvaging. Let time be the guiding principle--rot, insects, fungus, decay, and fire do not wait. The salvage must start now and leave the healthy stands intact. Depending entirely on the nature of the salvaging area will be the method of logging. Is it not true that in the majority of cases where timber has been destroyed the damage is patchy, that is it is not one clean sweep of destruction. Then we have the high speed, heavy logging equipment for logging placed at a loss as far as effeciency of removal is concerned. A high lead or a sky line may only cross a thousand board feet at every road. Naturally the method of logging dwindles down to caterpillars, ~~horse~~ and truck logging. Of course this is not true in the case of a blowdown or in which the timber has not been destroyed but just killed and blown over

over. Heavy modern equipment can here be utelized with effeciency. It is true that salvaging timber from a burn or blowdown is comparable to selective logging. Not selective as to large areas but to comparatively small areas where heavy equipment could not operate economically. Of course this is all determined before hand. The combination of caterpillar, truck, and railroad will make this selective method feasible and practicable. Although a system of high lead or skyline might be used in connection with a cold deck. Let the conditions control the course of action.

Let us return to another thought of salvage. That is relogging logged lands. Again this calls for a selective system which can cover large areas in a comparatively short time. I am not affirming that every logged area needs relogging but surely it is true of many areas. This question will be taken up on later pages.

In setting up the milling operation, there are the items of cost mentioned previously mentioned to be considered, such as additional costs of milling, grading, sorting, finishing, and marketing. In any salvage operation it is wise to ever think in terms of the finished product, for here is the costing point which in the final analysis

will determine profit or loss. In setting up the logging operation keep in mind that here is the place to do your selecting or culling of the logs which will ultimately end up in the form of a finished product, and will reduce many other costs such as waste disposal and expensive grading. Of course all grading cannot be done in the woods. There is bound to be some waste in the woods resulting from culls and fire-scarred trees which are only partially destroyed, but do not take into the mill anything which could easily have been discarded in the woods The line log in case of salvaging should be eliminated, and can be by selective logging in one sense of the word.

SCIENTIFIC STUDY OF SALVAGING

YEAR	SPECIES bd. ft. cu. ft.	SPECIES
1-5		
5-10		
10-15		
15-20		

The above form shows the rate of deterioation when used or filled in the field.

Observing the records of past studies of wood deterioation we find in the case of the Olympic Blowdown a rapid accumalative effect of rot in all species of timber. In five years Douglas fir deterioated 18, 8%; Sitka spruce 36,5%; Hemlock 78.2% board feet. Merely stating these figures ~~is~~ are insignificant. It is what they mean. They save repeated cruises and direct the construction of logging plans. These figures show which species must be removed first, and that the species which cannot be reached within the recorded time must be abandoned. No burn of any consequence can be salvaged entirely in so short a time as five years. Thus there is an entire loss of Hemlock.

To make detailed studies of the entire area of destruction is not what is intended as was pointed out previously. Detailed studies would simply delay the actual process of salvaging. But at the most efficient pace it will require, in the case of the Tillamook burn, a year to complete the plans for salvage. Therefore I will present forms to be used in recording figures from the salage work.

% of	Species	Total Cruise	Reconnaissance notes	Character of timber
Hemlock				
Fir				
Spruce				
Cedar				

Deterioation data taken from the Olympic Blowdown found on page twenty-four

RELOGGING POSSIBILITIES

1. Clean up

Increasing the lumber prices makes possible profitable salvaging as does increasing the value of gold, it makes possible the mining of a cheaper grade of ore, thus with the increasing of timber prices makes possible the utelization of many inferior species and grades of lumber. Portable mills on cars utilizing the abandoned road-bed of past logging operations will be the one means of efficiently salvaging the remaining timber. All in all the handling cost of salvage is greater than logging and milling a normal stand of timber.

Immediate salvage means immediate progress toward a maximum return from the land in forest products. Delayed salvage means delay before replanting of the forest lands. Posponed salvage means the destruction of the natural reproduction and a delay of artificial reproduction.

COMPUTING COSTS OF SALVAGING

1. Keep separate accounts and cost accounts of salvaging the timber as to the cruising, bucking, falling and railroad costs. All general logging costs.

2. Separate accounts for milling costs.

1. sawing
2. storage
3. kiln drying
4. finishing
5. manufacturing

HOW SOON AFTER A FIRE CAN DAMAGE BE ESTIMATED ACCURATELY?

It has long been realized that the damage resulting from a forest fire cannot be accurately estimated immediately after the fire except where destruction is complete. To determine how much time should elapse before a reliable estimate can be made, studies of experimental burns were conducted in 1931 and 1932 at the Michigan Forest Expirement Station in cooperation with the Lake States Forest Experiment Station of the United States Forest Service. Results indicate the 3 to 4 months should elapse after a fire before damage estimates are made.

In making the study, repeat tallies at intervals of 1 month, 3 to 4 months, and 12 to 17 months were made on a number of fires in the surrounding territory. All plots tallied a month or less after burning showed heavy losses in all of the smaller sizes of trees, while the plots checked 3 to 4 months after burning showed little or no later loss.

Although the stand remaining after any fire will present conditions peculiar to the particular situation and will require study of special treatment, some conclusions resulting from the study may be of general application. Mortality of fire-injured trees from insect attack was

found to be greatest during the first and second years following the season in which the fire occured. A resumption of more nearly normal conditions of insect activity was observed in the stand during the third year after the fire. The types of fire-injured trees that should be marked for salvage on any given fire area will depend to a large extent on the material that is left on the area. Trees that have suffered 100 percent defoliation and also have had most of the buds killed will succumb without further injury by insects and should not be salvaged. Trees that have suffered no fire injury should not be cut unless the lumbering operation is directed toward harvesting the stand in addition to the salvage lf injured material.

The relative probability of recovery without insect attack is indicated by the following list, which progresses from the least susceptible type to the most susceptible:

0 to 25 percent defoliation,	no or slight	cambium	injury.
25 to 50 percent defoliation,	no or slight	cambium	"
0 to 25 " "	Moderate to heavy	"	"
25 to 50 " "	" "	"	"
50 to 75 " "	no or slight	"	"

75 to 100 percent defoliation, no or slight cambium injury.

50 to 75 percent defoliation, moderate to heavy " injury.

75 to 100 percent defoliation, moderate to " " injury.

Although the severity of the injury and the number of trees left on the area determine to a great extent the types of fire-injured trees that should be salvaged, the results of this study indicate that in general it would pay to salvage the following classes, as the chances are great that otherwise they will succumb to insect attack:

Trees having more than 50 percent defoliation and moderate to heavy cambium injury; and trees having 75 to 100 percent foliage injury and no or slight cambium injury.

Some of the killed timber may be salvaged for lumber at a profit but prompt action will be required.

Rapid decadence, through attack by insects and disease, sets in after timber is killed or seriously injured by fire. Timber quality is not affected by fire directly, except where actually burned. But insects penetrate the bark, the sapwood, and ultimately the heartwood, and they usually set to work on these processes immediately. Into the openings, borings, galleries, and pinholes made by insects drift the diseases that cause rot. Hemlock, balsam fir, and young second growth Douglas fir killed by fire are beyond profitqble salvaging within two years according to past experiences. Sapwood goes first in Douglas fir. In 20 inch trees sapwood may make up 35% of the volume and in 60 inch trees, from 15 to 17 percent. At the end of five or six years the sapwood is completely penetrated by borers and is breaking down because of rot. Within 10 or 12 years the borers have penetrated the heartwood, frequently to a depth of 12 inches. These figures are estimatedaverages. Although decadence varies in different localities under fluctuating conditions, salvage operations should take place promptly after a fire.

Year	Deterioation (percentage of total volume)					
	Douglas Fir		Sitka Spruce		Western Hemlock	
	Bd. Ft.	Cu. Ft.	Bd. Ft.	Cu. Ft.	Bd. Ft.	Cu. Ft
1921.....	1.0	0.7	3.0	3.6	13.0	12.8
1922.....	1.8	1.5	7.5	7.3	32.0	30.5
1923.....	3.1	2.8	12.5	11.5	51.3	42.8
1924.....	7.0	6.5	20.2	17.5	64.5	49.5
1925.....	13.0	11.5	28.5	24.4	74.0	53.3
1926.....	18.8	17.5	36.5	32.0	78.2	55.0

SALVAGING AS A NATIONAL AND STATE PROBLEM

Because of the stupendous values involved, the immediate loss faced by private capital and local agencies and the need for early salvage if even the accessible timber is to be salvaged, a problem of local, state and national interest has arisen. Prompt and concerter action by private and public owners or agencies is required to minimize the loss. This is not a time for single-shooting. Not only should the owners of burned timber receive all possible cooperation from the rest of the indistry to enable them to market their timber, but the public (including taxing bodies) is entitled to have everything possible done to aboid the waste of cutting green timber while this dead timber stands unused and a continuous hazard to subsequent reforestation.

Let us take for example the Tillamook burn. A proposed plan of salvaging was propounded and revisions of the plan were presented, but the latest news report of this situation tells us that only ten million feet is the allocation for the second quarter quota to be taken from this area. There must be no restrictions placed on this area. Records of the fire show that out of the fourteen and one half billion feet of timber within this area, twelve and one half billiom feet was in one way or another effected by the fire, whether totally burned, partially burned, or only the roots destroyed

so that the wind has toppled the trees. Assuming that twelve and one half billion feet is salvageable, and at the rate of deterioation and the allocation made for this area it would take 312 years to remove the entire amount. The question is just how much of the timber is salvageable, that is how much of the timber was only killed and not destroyed. Conservative estimates place this figure at ten billion feet, but this seems high. Therefore let us figure this in another way by computing how much timber can be removed in the economical salvage life of each species. Applying the tables given on page for Douglas fir, Hemlock, and Sitka spruce for five years, assuming that five years is the economical salvage life of Douglas fir, three years for spruce, and two years for Western hemlock, we find that two billion five hundred million board feet would have to be cut annually.

The comparative market values of each of the species is such that only Douglas fir and spruce and cedar should be logged after two years have elapsed. The stand is computed to have 20% Western hemlock. Whether any of the hemlock should be salvaged will depend on the market value, to a large degree, the method of salvaging or logging. Five years perhaps would be the limit at which, from a commercial viewpoint,

any of the species could be salvaged. Therefore the maximum amount of timber which could be sawed would exceed not over two hundred million feet, or 1% of the potential salvageable timber. Seventy-six and one half percent of the timber on the Tillamook area was 20'' in diameter and over, sixteen percent was second growth and under 20'' in diameter. On this basis we can only say that 76.5% was actually salvageable from a commercial viewpoint.

The state government and particularly the national government owes its cooperation to the people of Tillamook, Washington and Yamhill counties, to increase the alloted quota of timber which can be removed from these three counties because they have suffered a loss of forty three percent of all taxes levied in Tillamook county in 1930

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The Tillamook Fire

Staggering Losses In Oregon's Big Forest Fire Estimated

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The Tillamook Fire

By SINCLAIR A. WILSON

(The following account of the great forest fire in Oregon, a month ago, and its economic meaning, was prepared especially for the Four L Lumber News by Mr. Wilson. Mr. Wilson is senior forest economist of the Pacific Northwest Forest Experiment station, Portland.)

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A HIGH WIND, LOW HUMIDITY and dry burnable fuel carried fire of small beginnings over a sizable area and then within 20 hours swept it over America's largest remaining fine stand of privately-owned timber, affecting in great measure invested capital, employment of men, county and state finances, and the future use and ownership of this land, and calling for stupendous concerted private and public effort to salvage whatever values remain. This, in brief, is the scope of the debacle of August 14 to 25, 1933, in the high country of Tillamook, Washington and Yamhill counties, Oregon. It is called "The Tillamook Fire". Although insufficient time has elapsed to gather reasonably accurate fire loss data, enough is known to convince me that the situation commands national concern and extraordinary measures.

Fires originating near the northwestern corner of Washington county on and shortly after August 14 had traversed approximately 40,000 acres by midnight of August 24. This sector was fairly accessible when compared with the entire zone subsequently embattled. But at about midnight of this fateful Thursday the wind veered to the east and increased in velocity and humidity dropped. Then the fires took on a new fierceness, made dry material in front of it more dry, spread to a broad line, and during 20 hours thereafter raced and raged to the south and to the west over a vast wilderness of 300-year-old monarchs, unfrequented by man, lacking in roads and trails—a land of high hills, deep canyons, and steep slopes. At the end of 20 hours adverse wind and humidity conditions abated. The fire ceased its forward march. Heat and smoke prevented speedy investigation of area covered and damage caused. However, a line was drawn about what was thought to be the outside limits of the stricken zone. This line encompassed 311,000 acres of land. With the fire greatly lessened and the smoke lifted, some penetration has been possible—the line has at this writing been contracted to include about 290,000 acres and within it about 13,500 acres of unburned timber have been located, leaving a present estimated net of 276,500 acres. When investigations are completed the net area burned may be lessened slightly. About 2 per cent of the burned territory appears to lie in Yamhill county, 16 per cent in Washington county, and 82 per cent in Tillamook. Can you picture a fire large enough to sweep over every inch of Multnomah county or of Wahkiakum county? Yet the extent of "the Tillamook fire" is far greater than either of these.

Types of Timber

The figures presented hereinafter are based upon estimates only, gathered from incomplete sources, and are presented for no other purpose at this time than that of comparison. When investigations now in progress are completed, better information will be available.

The following table is an estimate of type areas expressed in per cent within the exterior limits of the fire as known August 28, taken from forest survey data on file at the Pacific Northwest Forest Experiment station, Portland:

TYPE	Tillamook County Per Cent of Acreage	Washington County Per Cent of Acreage	Yamhill County Per Cent of Acreage	Total Per Cent of Acreage
Coniferous timber over 20" diameter	64.2	12.0	.3	76.5
Second growth under 20" diameter	14.1	1.9	...	16.0
Deforested burn (from previous fires)	1.0	.3	...	1.3
Recent cut overs (logged since 1920)	.9	....	1.8	2.7
Non-restocked cut overs (logged before 1920)	.2	2.0	...	2.2
Hardwoods	.8	....	...	.8
Farm land	.5	....	...	.5
Totals	81.7	16.2	2.1	100.0

Within the supposed exterior limits of the fire 14,448,000,000 board feet of timber were standing before the fire, of which 82 per cent is Douglas fir, 15 per cent hemlock, 2 per cent cedar, and 1 per cent other species. The bulk of it was mature merchantable. How much of this has been actually killed is a guess, but guesses now place the figure at over 10 billion board feet. Except for the two small "islands" of green timber left untouched (previously mentioned) whatever escaped appears to be sparsely scattered among the dead and dying. It appears safe to estimate that 12½ billion feet are affected in one way or another in the immediate vicinity. This figure approximates the total reported production of lumber, lath, shingles, and pulpwood of all the mills in the United States in the year 1932.

If we can assume that $2 per thousand board feet is the approximate stumpage value of the timber, then the total value of the timber affected will approach $25,000,000, a potential present timber loss faced by the owners, possible of some reduction if promptly salvaged.

Employment Factor Told

The direct employment factor is staggering. On the average, two men (one in the logging camp and one in the sawmill) will produce 1200 board feet per 8-hour day or 150 board feet per hour. One man would produce, then, 75 board feet per hour. At this

rate about 167 million man hours would be required to run 12½ billion feet from the stump to and through the sawmill. This means over 4 million man weeks of 40 hours each. Expressed in another way, nearly 14,000 men would be directly employed in camp and mill for a period of 300 weeks of 40 hours each. About six years of solid employment for 14,000 men, to say nothing of indirect employment. If every laborer feeds four mouths, this employment would win bread for 76,000 souls for six years. Based on average wages paid in the Douglas fir region, 12½ billion feet represents $117,000,000 in the potential earnings of direct labor for 1929, $106,625,000 for 1930, and $80,125,000 for 1931.

In the Douglas fir region, the average pre-depression lumber value f.o.b. mill was $22 per thousand board feet and the average transportation charge on lumber from mill to consumer was $8—the total was $30 per thousand board feet. Based upon these averages, 12½ billion feet of lumber production normally means $275,000,000 to the industry, $100,000,000 to transportation, or a total of $375,000,000. This sum is approximately twice the amount of money on deposit in all of the banks of Oregon in 1929. Twelve and a half billion feet of timber and $375,000,000 are estimated as placed in jeopardy by the Tillamook fire — the greater part taking place in 20 hours. The public stands to lose ultimately $5.00 to every $1.00 lost by owners of timbers and mills.

Tax Values Killed

Although Washington and Yamhill counties and their political subdivisions stand to suffer some, Tillamook is faced with a serious situation. Timber values, not including logging railroads and equipment, constituted about 58 per cent of the tax base (assessed valuation) immediately prior to the fire. Assessment for tax purposes was not predicated upon the producing capacity of the land but upon the present value of forest crops that normally would not be harvested completely for many years. The public services conducted for the people have built upon this foundation and their successful administration, maintenance, and debt retirement have depended upon it. Yet, within 20 hours a substantial portion of this tax base was killed. I roughly estimate the 1930 tax against the timber within the Tillamook county fire line alone at a low of $400,000 or 43 per cent of all the taxes levied in Tillamook county against the total assessment roll. A serious direct future annual loss in income is faced by tax-supported agencies in Tillamook county. In 1932 about one-third of the privately-owned lands within the fire area were delinquent for taxes levied in 1930 and prior years. The accumulated tax bill on private timber in 1933 may approach the million mark, of which a portion may be recovered through salvaging the burned timber.

How much of the area burned will remain in private ownership is a question. Within the fire area were over 30,000 acres reverted for taxes and owned by Tillamook county. These areas were abandoned by the owners and acquired by the county within about ten years after fires of 1918 and 1922 had killed the merchantable timber thereon. Restocking the newly burned area with forest growth will take time, and after that is accomplished many years will elapse before the crops can be harvested. No use higher than forest is known for these rough mountain lands.

Salvage Must Be Prompt

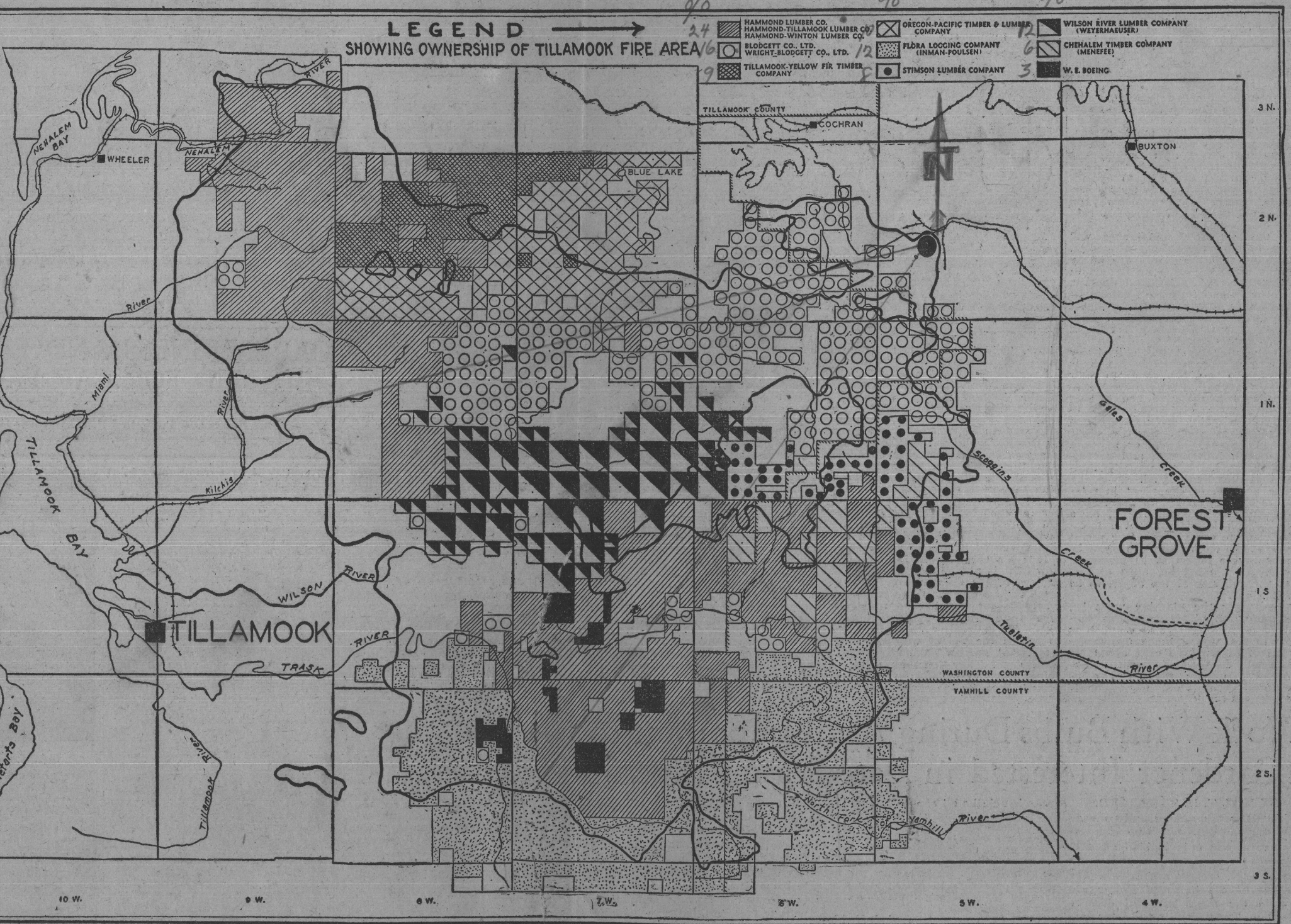
Some of the killed timber may be salvaged for lumber at a profit but prompt action will be required.

Rapid decadence, through attack by insects and disease, sets in after timber is killed or seriously injured by fire. Timber quality is not affected by fire directly, except where actually burned. But insects penetrate the bark, the sapwood, and ultimately the heartwood, and they usually set to work on these processes immediately. Into the openings, borings, galleries, and pinholes made by insects drift the diseases that cause rot. Hemlock, balsam fir, and young second growth Douglas fir killed by fire are beyond profitable salvaging within two years according to past experiences. Sapwood goes first in Douglas fir. In 20-inch trees (Douglas fir) sapwood may make up 35 per cent of the volume and in 60-inch trees, from 15 to 17 per cent. At the end of five or six years the sapwood is completely penetrated by borers and is breaking down because of rot. Within 10 or 12 years the borers have penetrated the heartwood, frequently to a depth of 12 inches. These figures are estimated averages. Although decadence varies in different localities under fluctuating conditions, salvage operations should take place promptly after a fire.

Because of the stupendous values involved, the immediate loss faced by private capital and local agencies, and the need for early salvage if even the accessible timber is to be salvaged, a problem of local, state and national interest has arisen. Prompt and concerted action by private and public agencies is required to minimize the loss. This is no time for single-shooting. Not only should the owners of burned timber receive all possible cooperation from the rest of the industry to enable them to market their timber, but the public (including taxing bodies) is entitled to have everything possible done to avoid the waste of cutting green timber while this dead timber stands unused and a continuous hazard to subsequent reforestation.

Copies of the reprint of Mr. Wilson's article may be had on application to the Four L Lumber News, 500 Concord Building, Portland, Ore. The Four L Lumber News is owned, controlled and published twice a month by the Loyal Legion of Loggers and Lumbermen, commonly known as the 4L. In the 4L both employes and employers have an equal voice on all matters of mutual interest.

MAP OF TILLAMOOK FIRE ZONE SHOWING OWNERS OF LARGE HOLDINGS WHERE FIRE SWEPT THROUGH TIMBER



SEVERAL CONCERNS BEAR BRUNT OF TERRIFIC FIRE LOSS

to save whatever is possible in the biggest disaster in Oregon's history are being planned.

daily capacity running full blast 300 days a year for 146 years, supplying enough lumber to build homes for

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LUMBER PRODUCTION LISTED FOR QUARTER

TOTAL OUTPUT LIMITED TO 4,550,000,000 FEET.

West Coast Douglas Fire Allowed 1,285,000,000, and Tillamook Burn 10,000,000 Feet.

WASHINGTON, D. C., March 27.-(AP)-The national control committee of the lumber code authority today set the lumber production quota for the second quarter of the year at 4,550,000,000 feet—3,650,000,000 feet of softwoods and 900,000,000 feet of hardwood.

Average quarterly production in 1933 was approximately 3,300,000,000 feet, but in peak years the average quarterly production was between 8,000,000,000 and 9,000,000,000 feet.

The authorized production is approximately 10 per cent lower than the figure for the first quarter of 1934, but, the committee said, there will be no decrease in production or employment, because of an estimated carryover from the first quarter of about 600,000,000 feet of unused allotments. The mills will be permitted to cut this amount during the second quarter.

Quota allocations to the various divisions under the code were as follows: West coast (Douglas fir), 1,285,000,000 feet; Tillamook burn (Oregon), 10,000,000; redwood, 98,000,000; southern pine, 1,285,000,000; western pine, 750,000,000; northern hemlock, 60,000,000; northeastern states, 80,000,000; northern pine, 35,000,000; cypress, 39,000,000; Appalachian softwood, 18,000,000.

The shingle quota was placed at 1,548,000 squares for United States mills and 387,200,000 squares for Canadian imports.