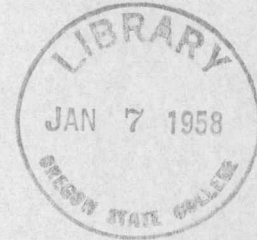


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SLASH DISPOSAL ON THE PRIVATE LANDS  
OF EASTERN OREGON  
UNDER THE STATE FOREST PROTECTION ACT  
BY  
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A THESIS  
PRESENTED TO THE FACULTY  
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SLASH DISPOSAL ON THE PRIVATE LANDS  
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INTRODUCTION

How can forest practice be improved on the private lands? This has been a question in the minds of many foresters for a good while. That slash disposal is of prime consideration in this problem needs no verification.

The question of what to do with logging or woodcutting slash after operations are completed has been a perplexing problem in the management of certain timber types in the United States, especially in the Ponderosa pine. The United States Forest Service has made various studies of the problem and has made many recommendations, some of which have been enacted into regulations on the National Forest. These recommendations have not been applied on private lands and there is little probability that they will ever be. State forest protective organizations and other association protective organizations have formulated methods and have put them into use. Many of these methods have failed, directly or indirectly, in the reduction of hazard, and have certainly failed in many of the considerations other than fire hazard reduction. Constructive methods formulated by the private owners are practically wanting, mainly because of the general ideology of people concerning land use and because of pressure put upon the



owner by those people enforcing the State law. The problem of slash disposal is complex and has many angles for consideration.

It is the object of this writing to consider the various angles of the slash disposal problem on the private pine lands of Eastern Oregon under the existing State Forest Protection Act in an attempt to indicate where the sore spots are and wherein they may be corrected for the betterment of forest practice on the private lands. It is realized that no hard and fast rules can be applied to this area generally.

#### Importance of Problem.

The area under consideration takes into account those lands in private ownership in Ponderosa pine east of the summit of the Cascade mountains. According to the recent Economic Survey (14), the total acreage in private timber land ownership in this area is approximately 5,000,000 acres. This includes the pine and juniper stands. The area in the typical Ponderosa pine type is 3,864,160 acres.

Practically all of this vast area of over 3 million acres is more suitable for growing timber crops than for conversion into agricultural purposes (5). The areas generally are more accessible to centers of population and routes of good travel than the National Forest. Most of the land area is of moderate topography. In further study of the Economic Survey (14), the stands per acre on private lands for practically every county concerned is somewhat higher than that on the National Forests. This gives an indication where the

better pine land is situated. Of even more import is the fact that 90 per cent, approximately 90,000 acres, of all the pine land cutover each year is taken from the private lands.

Slash disposal has been a subject of study since as early as 1907 (13) when the United States Forest Service indicated that piling and burning should be practiced on certain lands. Various studies have been made, but yet conditions still exist that were common practices in the early days of settlement. Land owners have not yet realized the significance of conservation and the consequences of destructive burning practices. Protective organizations are still attempting to place fire protection over all other considerations, with little thought toward sound forest practice.

The problem takes on greater importance when the actualities of what is happening to these lands are presented. Practically all of the 90,000 acres cut each year are being clear cut. Broadcast burning or modifications of broadcast burning such as spot burning is the method, or recommended method, used on many of the holdings. Erosion is being accelerated because of the lack of vegetative covering. Silvicultural and grazing values have both been altered by such practices.

The public and the state are vitally interested in this problem. The public is directly interested in water and soil conservation, in game preservation, in recreation, and indirectly in the perpetuation of the pine timber resource. The

state and counties are deeply concerned in that these lands form a considerable amount of the tax base of this area. The United States Forest Service are interested because land exchanges are particularly effected by the condition in which these lands are left. The state is in no position to accept lands that have gone to destruction through the malpractice of logging and slash disposal methods. The private owners and operators have not realized the significance of conserving land residual values. There is no one who wants waste, barren, soil-eroded timber lands.

To further accentuate the problem, this vast area of pine land is divided by innumerable ownerships, the sizes of which vary from tracts as small as 10 acres to areas of thousands of acres. National Forest, state, county, and private lands are dove-tailed together in many cases, making uniformity of practice practically impossible. Many of the owners of current logged lands reside in other parts of the United States and know little and care little about what happens to the areas after the timber value is taken off. The various counties are not in the timber business, and consequently, think only in terms of getting rid of tax-delinquent lands. The decisions are left to the whims and fancies of each land owner. There is no central organization of thought as to what conditions lands are to be left in, consequently, land owners seek the line of least resistance.

#### Method of Procedure and Source of Data.

In making this study of slash disposal on the private



lands of Eastern Oregon under the State Forest Protection act, the several considerations have been isolated in order to correlate the entire problem. For convenience, the paper has been divided as follows: The fire danger consideration; the future productivity consideration; the economic consideration; planned slash disposal; and slash disposal under past law and the present Forest Protection Act.

In order to get facts and information concerning the various angles of the slash disposal, a research was made covering several of the bulletins and publications which applied to this area or areas where similar conditions exist. The information concerning much of the treatise on the present workings of the State Forest Service and the Forest Protection Act was gathered when the writer was in active duty as Forest Inspector for the State Board of Forestry. Private owners and persons connected with the State Forest Service were contacted to gain the general thought and opinion on the slash disposal problem.

## FIRE DANGER CONSIDERATION

The possibility of fire is somewhat increased by the presence of logging or woodcutting slash on the private lands of Eastern Oregon. J. W. Girard and W. C. Lowdermilk, in an unpublished report prepared in 1922, define the purpose of slash disposal as twofold: (5)

Namely, the reduction of the fire hazard to the safety point and the favoring of a complete restocking to the desired species.\*\*\* The objective in the reduction of fire hazard is to dispose of sufficient of the logging slash to make possible the effective fighting of fire on the tract during the fire season.

From the standpoint of fire protective organizations, the object of slash disposal is the reduction of the excess debris to the point where fighting fires is a practical possibility. This point in reduction varies somewhat, and there is still an unsettled argument as to just how much should be burned in order to get the desired results. The private owner is obligated by law in Oregon to abate his fire hazard. Thus, it is the objective of land owner to reduce his fire hazard to the point where it will be accepted by the State Forest Service or other protective organization as a normal risk. This means that the slash must be reduced to the point at which the area will approximate conditions before logging began or as classified by the State Forester.

### Volume of Slash.

In determining the amount of slash disposal necessary, the volume of slash is a pertinent consideration. The quantity of debris left after operations in the pine is quite

variable and it is important that a study be made of each slash area before evaluating the existing hazard.

Variations in volume are due primarily to the character of the stand, with the methods of cutting, and with the degree of utilization.

The character of the stand is the chief cause of great variability in the Ponderosa pine areas. In general, the larger the stand per acre the larger the quantity of slashings. In many of the stands of North-eastern Oregon where open park-like stands occur with large open grown trees, having large flat-topped crowns, the volume of slash in proportion to board foot volume is somewhat increased. In portions of Central Oregon and Southern Oregon where stands of 15,000 to 20,000 board feet are common, the trees being much closer together and the tops shaded out, the proportion of slash in proportion to board foot volume is much less. The maximum quantity of slash (5) per thousand board feet occurs in the open grown stands where a considerable percentage of the trees have large limbs, and are badly infected with mistletoe. An idea of the variations of volume can be recognized from the following table:

Table 1.--The relation of total gross volume of the stand to the volume of slash per acre and per thousand board feet.



Gross Volume per Acre (M feet b.m.)	Vol. of Piled Slash		Gross Vol. Per Acre M feet b.m.	Vol. of Piled Slash	
	Per Acre	Per M		Per Acre	Per M
	Cu.Ft.	Cu.Ft.		Cu.Ft.	Cu.Ft.
4	2,480	620	16	3,040	190
6	2,592	432	18	3,132	174
8	2,696	337	20	3,200	160
10	2,780	278	22	3,280	149
12	2,880	240	24	3,336	139
14	2,954	211			

(Note): Table taken from U.S.D.A. Technical Bulletin No. 259. Figures based on 16 sample plots; data curved.

The methods of cutting and logging often is a consideration when sizing up the volume for hazard reduction evaluation. In the Southwest (9) Ponderosa pine area where conditions are similar to Eastern Oregon it is indicated that horse logging creates more slash than in other methods, because in horse logging it is necessary to cut roads and skid trails through patches of saplings. This is true in a few cases in the pine of Oregon, but it is generally conceded that tractor and power logging creates more slash in this area. Whereas, there is not so much of the actual young growth cut, there is large amount of growing material that is grubbed out in power methods of logging and growth so badly injured that after the first year this adds to the initial slash volume. Tractor logging is the predominant method used on the private lands, and, consequently, the slash volume is sometimes quite high, but it is not as

heavy as in logging with the cable systems.

The degree of utilization naturally affects the slash volume. This is particularly true on many of the small operations, especially those near centers of population and near agricultural districts. In one specific case an operator in Northeast Oregon was able to get his slash volume reduced over one-half by permitting local town people and farmers to take out the limbs and tops for wood. Whereas this does not apply to the large areas, it does, in part, answer the problem on many of the smaller holdings.



Fig. 1



Fig. 2

Photographs Showing Volume of Slash on Current Logged Lands.



### The Arrangement and Distribution of Slash.

The danger of fire is well correlated with the arrangement and distribution of the slash. The volume may be quite high, but if the material is partly windrowed or in isolated patches the possibility of fire reaching a magnitude in a short time is somewhat minimized. The methods of logging and the falling methods used are the chief causes for the variation in the distribution. In Studies made by Munger and Westveld (5) for various parts of Eastern Oregon the distribution of slash varies according to the logging methods used, irrespective of the volume. Power logging generally scatters the slash more than any other of the methods used. Horse logging, because some slash must be thrown out of the way in order to get horses through, tends toward the windrowing of much of the slash. Tractor logging with its many variations leaves the slash in windrows more than any of the methods used.

In evaluating the slash hazard, and in selecting a method of disposal it is all important that the method used in logging be considered. Tractor and truck logging which is the most common method used in Eastern Oregon leaves the areas cut up with innumerable tractor skid roads and truck roads. The skid roads are from 8 to 12 feet wide and generally down to the mineral soil. These roads cross each other in many places, isolating the slash in small areas. The truck roads under such methods of logging form a network over the area. These skid roads form excellent fire guards

during the most hazardous life of the slash. The roads form excellent means for getting to the areas and also provide some protection as fire guard. Fire may get started in the area but the possibility of getting across these existing guards is greatly minimized. Areas having been logged by tractor and truck should be carefully studied before applying any method of slash disposal. Horse logging on the other hand is not so fire proof as "Cat" logged areas. The skid roads are more numerous but many of them narrow and seldom down to mineral soil. Truck roads are numerous but are not always used extensively enough to form good fire guards. But, as most of the slash is left in situ from each tree, areas horse-logged have more area free from slash than any other methods used. Power logging, that is logging with the cable systems, leaves the areas in the most hazardous conditions from a distribution standpoint. These operations need especial precaution, but, as they are rarely used in the pine area, their consideration here is of minor import in the slash distribution problem.

#### Location of Slash Areas.

The location of slash in relation to adjacent growth, the surrounding topography, the nearness to other bodies of slash, and susceptibility to public contact are factors which should be thoroughly analyzed before recommending and applying any slash disposal method.

Many times the slash is practically isolated from growth desired in the management of timberland areas. A ridge may

have a sizeable volume of timber upon it, but either side may be grass area or timber type relatively fire proof. The slash area may be entirely surrounded by sparse reproduction areas in which fire under most conditions could not travel. The growth surrounding hazardous areas should be evaluated as to economic value and possibility of fire travelling in such areas.

Recognition of the importance of the topography is important in a study of the need for slash disposal. In studies made in California (5) it was found that fires on 5 to 15 per cent slopes were two and one-half times larger than fires on slopes of 0 to 5 per cent. A large per cent of the land in private ownership in Eastern Oregon is of moderate slope. On relatively level areas which have good road systems fire is unable to reach much size before the protective force arrives.

The possibility of a disastrous conflagration is generally considered in the pine in relation to the size and location of the slash areas. Small areas isolated from other bodies of slash are considered as presenting little hazard. Large contiguous bodies of slash are regarded as potential disasters. A large share of the areas under consideration are far removed from other such areas. A good example of this condition is cited for one particular land owner in Northeastern Oregon. The owner had twelve gypso operators removing logs from his lands at one particular time. Only two of these operations were within one mile of



each other; the other ten were from two to twenty-five miles apart. Similar conditions exist over the whole pine area. It is seldom that areas are cut so as to form one large contiguous area. Under such conditions, if fire did break out, the possibility of fire reaching an enormous acreage is small.

Public routes of travel, such as highways, railways, and trails, present the greatest source of fire trouble. It is along such places that there is a special need for hazard reduction, because it is there that a great majority of fires originate.

#### Regression of Hazard by Natural Cause.

That the hazard from slashings recedes somewhat each year is a proven fact. This is due mainly to decomposition in the form of decay, and disintegration by climatic forces. Studies (5) in Eastern Oregon indicate that this regression begins immediately. The first year after creation of the slash the needles turn brown; the second year the needles have begun to fall off; by the third year eighty per cent of the needles are off, and Western red rot is abundant in the tops; at the end of the seventh year, branches up to 1 inch in diameter have fallen to the ground; and at the end of fifteen years the slash hazard has practically neutralized.

The combustibility of slashings decrease as decomposition and disintegration continues. At the end of the first year the needles have lost a great deal of their

inflammability due to loss of the volatile resin by heat and wind. When the needles are off, the flash of the material is gone, consequently reducing the speed in which the fire is able to travel. At the end of five years the hazard is thought to have decreased to such a degree that now there are protective organizations who are willing to accept the excess hazard as a normal risk.

Amount of Hazard Reduced by Slash Disposal.

No method of slash disposal completely eliminates the fire hazard. There are several methods that reduce the hazard to a satisfactory point and there are other methods in which the hazard reduction is more apparent than real. Piling and burning as used on the National Forests probably reduces the hazard more than any other method. Compilations of fire data (5) indicate that for the three National Forests (the Crater, Wallowa, and Whitman) the run-over by fire where piling and burning was practiced was only 0.01 per cent annually. This indicates a high degree of immunity. Areas where broadcast burning, or modifications of broadcast burning was used, have had in many cases more hazard at the end of two or three years than was presented on the area before such burning was done. This was due to the large amount of growth killed at the time of burning which later fell to the ground and to the large amount of material that was unconsumed.



Fig. 3. Brush piled along road in strip method of disposal.



Fig. 4. What happens sometimes in broadcast burning.



### FUTURE PRODUCTIVITY CONSIDERATION

Perpetuating the Ponderosa pine stands on the private lands of Eastern Oregon is a salient consideration when its significance is realized. There are more than 3 million acres involved which is primarily timber land of good quality. A large proportion of the population is directly or indirectly dependent upon the future productivity of this vast area.

The method of slash disposal adopted has a direct bearing upon the future condition. Reproduction may be practically all conserved or may be entirely destroyed by good or bad burning practices. Grazing areas may be left in greatest productive state or may be practically eliminated by destruction of forage grass and replacement by adverse growth. Water and soil may be conserved by leaving the vegetative cover intact and permitting debris to decompose, or the cover may be removed to such a degree that sheet erosion and gully formation work disastrously.

In order to weigh the various considerations in the future productivity phase from the standpoint of leaving slash or practicing disposal, each item is reviewed as follows: The silvicultural; the erosion and conservation of water; the grazing; the entomological; and the pathological.

#### Silvicultural.

The question is often raised, "Does slash aid or hinder normal restocking?" There have been a number of studies in the Ponderosa pine concerning this question. In studies (5) by Munger there are certain losses and gains attributed by

undisposed slash. Where slash lies heavy and compactly on young growth there is a possibility of some loss, but such heavy accumulations occupy a very small portion of the forest floor. On the other hand there are certain benefits that may be attributed by the presence of slash, such as conservation of soil moisture, creation of a desirable seed bed, and protection from grazing (3). It may be concluded from these studies over various parts of the Ponderosa pine area that slash is generally beneficial to advance and subsequent growth.

The effect of methods of burning upon reproduction varies with amount of area and volume burned and with the intensity of the fire. If only a small per cent of the area is burned over it is expected that the amount of growth harmed is small. But, where such methods as broadcast burning are used, it is expected that a large percentage of the residual material will be injured. It is possible to burn a large percentage of the area and yet do a minimum of damage if the fires are kept small and the work is done on cool, quiet days. And, conversely, a small amount may be burned by area but due to high wind or dry weather a maximum of growth will be killed. Studies (11) indicate that broadcast burning takes the biggest toll of young growth when from 56 to 91 per cent is killed. Piling and burning, from the same studies, does the least harm, as fire actually covers only 4 to 28 per cent of the area killing from  $\frac{1}{2}$  to 15 per cent of the growth.

Inasmuch as there is ordinarily an abundance of advance reproduction in the virgin forest, the question of how much is saved by undisposed slash or how much is destroyed by fire is dependent upon other considerations than silvicultural. It would be quite possible to destroy 50 per cent of the advance reproduction and yet retain sufficient number of trees to insure desirable conditions for a future crop. Of course this does not mean that every area has an abundance of growth and that indiscriminate burning may be practiced.



Fig. 5. An argument for broadcast burning?

#### Erosion and Conservation of Water.

That slash left upon the ground prevents erosion is shown by many soil erosion studies. Munger (5) in his studies of slash disposal indicates that slash left upon the soil effects the physical condition of the soil by making it more friable and consequently more absorptive, especially this is



true on the heavier soils. Slash also has a limited effect upon erosion through the mechanical holding back of rapid runoff. In the Southwest pine, where conditions are similar to those of Eastern Oregon, slash is sometimes scattered or pulled into places where vegetation is scant or into existing gullies to prevent further destruction. Slash could be utilized in Northeastern Oregon for the same purpose, especially on slopes of 20 per cent and where the soil is light textured. Deep skid trails are potential gullies on sloping land and it is here that tree tops would prove very beneficial in the control of erosion.

On the other hand, the disposal of slash by broadcast burning, or by any of the disposal methods, has a direct effect upon soil conditions. The burning of slash, grass, and other surface material robs the soil of its natural protective covering. This permits general sheet erosion on the badly burned spots and often results in gully formation. Studies by Fowells and Stephenson (2) show that burning destroys not only the organic material on the surface but may destroy some of that in the immediate soil surface. The accumulation of organic material is an extremely slow process in the Ponderosa pine area. According to T. J. Starker, professor in the School of Forestry, Oregon State College, it takes 100 years or more to produce one inch of organic material in Eastern Oregon. From all indications, it is very desirable to preserve all the organic material possible for soil fertility maintenance, erosion control, water conservation, and tree and grass growth.

### Grazing.

Grazing is an important issue on many of the private lands in the pine. There are many perverted ideas among the grazing factions and the land owners. Those interested in grazing put forth the argument that slash prevents the stock from fully utilizing the forage, that stock are hard to herd and manage in slash areas, that the danger from fire keeps them in constant fear of losing their stock. Dependable studies to show the accuracy of such statements have not been made. Grazing men insist that if the slash is not burned they will not rent such lands. The land owner, thinking in immediate return value, is put under pressure to burn over his land. It is the belief of the writer, after making extensive observations of many such areas, that their arguments are not too well justified.

The amelioration of grazing conditions by burning is generally more apparent than real. Sampson (10) reports that he has observed that such shallow-rooted grass perennials as blue grass (*Poa*) and fescues (*Festuca*) have been killed by a single fire. Both of these grasses are prevalent and form a part of the grass forage on Eastern Oregon areas. In most instances, methods of disposal now used in the pine do little more than burn off the needles and small twigs, leaving the bulk of the debris on the ground. Where areas have been burned severely the consequent growth is, in many instances, adverse as forage and makes it practically impossible to get stock into and through such entanglements. Species of *Ceanothus* and *Lodgepole*

pine (*Pinus contorta*) so fully occupy certain burned over areas that grazing is a near impossibility.

From a summary of the studies made, there is a direct indication that slash disposal from the standpoint of grazing is generally unwarranted. Burning destroys certain grasses, brings about adverse subsequent growth harmful to grazing value, and seldom reduces the mechanical effect to any large extent. Undisposed slash, on the other hand, protects grass from being overgrazed, makes for more humus in the soil beneficial to grass growth, and prevents the soil from becoming extremely dry.

#### Entomological.

It is often iterated that undisposed slash makes a breeding place for certain destructive insects which attack residual growth and other uncut areas. This has been quite definitely proved to be an unsound supposition. Findings of the Bureau of Entomology, (5) as applied to the Ponderosa pine type, indicate that slash does not constitute an insect hazard of any great economic importance to near-by trees. This is not all inclusive. United States Circular No. 411 indicates that in the case of sporadic cutting or just soon after operations have ceased, certain beetles may attack and kill living trees.

#### Pathological.

There are many rots found growing on Ponderosa pine slash, but seldom do they infect standing living trees. Due to unfavorable moisture conditions in Eastern Oregon, spore production rarely occurs, thus keeping the rots in the slash.



Danger from rot breeding in slash and infecting living trees is of little consequence and no special method of disposal is needed.

### ECONOMIC CONSIDERATION

Hazard reduction and future productivity have been discussed in their various phases. Both of these considerations are intangible from the standpoint of many land owners and operators. While these issues are most important from the eye of the protection man and the trained forester, neither are conclusive enough to persuade the owner that they are paramount over other considerations. The first thought of the private owner when slash disposal is suggested is what is it going to cost. Immediate economic cost is the primary consideration in practically every private owner's mind. If the cost is not consistent with or less than the costs of logging, then money spent for slash disposal seeks the line of least resistance.

On the National Forests, slash disposal methods have been formulated with the idea of conserving the most growth and reducing the hazard to the minimum, and lastly considering the cost of executing such a method. This is not at all out of line with good forest practice and may probably be perfectly economically sound when thought of in terms of future values. This is not the attitude of the private owner. He works in terms of immediate land use value and on an immediate cost basis. To the average land holder, it is the out-of-pocket cost that talks. It isn't what should be spent, but what is going to be spent that is considered when making a decision for slash disposal.

In the light of present economic circumstances, the land

owner is in no position to make unwarranted expenditures toward slash disposal. Business and values are far too unstable for the private owner to speculate hard, cold money into such long time investments as growing Ponderosa pine in Eastern Oregon. Taxation is high, the lumber and log market is at a margin, and rapid liquidation is the ideology, consequently, the average land owner is going to spend as little as possible for such necessary enterprises as slash disposal. The possibility of enlightening the owners toward the necessity of spending more for slash disposal in light of better forest practice is vague. Democracy is still existent. Money still talks. The economic consideration must be attacked from a different angle if better forest practice is to follow on these lands.

#### The Ultimate Use of the Land.

In determining the method of disposal, there is always the question of land use. On some of the smaller holdings near agricultural lands where the owner decides to convert the area into farm use, there is little question of what to do--remove and destroy all residual growth and debris in the cheapest way. But, the majority of lands now being cut are primarily suitable for growing timber crops (5). Some of the lands are thought to be for grazing purposes only.

Since the revenue from grazing is practically the only immediate cash income that may be expected from many of the cutover areas, it is very easy to see the general tendency of the owners holding such land. Many thousand acres of



private land in Eastern Oregon are at present being grazed, but grazing alone will not carry these lands under present economic conditions. Land classification is badly needed. The lands should be classified as agricultural land, grazing land, timber land, grazing and timber, or water-shed. But, land classification is still in theory in this State. Action is needed immediately to improve conditions on these private lands. It is improbable that land owners will become classification conscious enough to bring about effective results.

#### Costs of Executing Present Slash Disposal Methods.

Spot burning with an attempt to reduce 50 per cent of the volume of slash and cover 20 per cent or less of the area with fire cost from one to three cents per thousand board feet or from 9 to 20 cents per acre. These figures were taken from actual burning cost records for burned areas in Union and Wallowa Counties and for Klamath County for the year 1937 (7). These figures indicate a very low cost, but they represent about what most private owners are willing to do in the way of slash disposal.

Partial disposal by piling and burning, approximating a 25 per cent disposal by area, cost one private company in North-east Oregon 35 cents per thousand on about 5000 acres. This consisted of piling and burning all debris along each side of all main routes of travel to a distance of 100 feet, and piling and burning on 100 foot wide strips through various parts of the area. The job was done under

U.S.F.S. supervision and was concerned in a land exchange. This expenditure for disposal is far in excess of what may be expected from the average owner for such work.

No disposal and charging anticipated disposal costs to more intensive protection has been worked out. For a specific case in Central Oregon, Westveld (11) indicates that the cost for intensive protection where no disposal was done, except for excessive accumulations along routes of travel, based upon a 15 year period amounted to approximately 47.5 cents per acre. Inasmuch as the state law requires the slash hazard to be abated, this method has not been used to any extent on private lands. There is little doubt that this method needs thoughtful consideration for possible application of many of the holdings of Eastern Oregon.



### PLANNED SLASH DISPOSAL

Slash disposal should occupy a place in any logging plan. It is a part of the operation, just as much as cutting or hauling. In the past the private operator considered that slash was merely a "necessary evil" as a consequence of logging and that the only thing to do with the mess, after operations were over, was to get rid of the debris with the least cost and effort and as quickly as possible. In many cases, it was only when a warden or ranger came around and indicated that the hazard must be reduced that the operator or owner would make some sort of a gesture toward disposing of the slash. Little or no effort is made to put slash disposal in the regular plan of logging an area. The result of such practices has led to the destruction of many fine stands of reproduction and little reduction of the bulk of the hazard.

Plans should be made prior to the actual logging of the area. Where land owners contract their timber to gyppo operators, there should be a definite agreement as to how slash is left. Truck, tractor, and skid roads should be planned in as far as possible for initial and future protection of the cut-over area. Felling of trees should be so directed that all trees be felled out of Ponderosa pine group stands. Tree tops could easily be pulled into openings with the tractor at the time the logs were skidded. All snags could be felled in conjunction with the regular felling process. These plans could be worked in simultaneously with the logging



of the area. When operations were complete, the slashing hazard could be evaluated and a method of disposal selected, whether it be leaving the slash or piling and burning certain portions of the area. To further enhance the slash disposal problem, a rotation of cutting the areas could possibly be used. One slash area could be rotting away and the hazard materially decreased before returning to an area adjacent. This would aid materially in keeping large contiguous areas from forming.

SLASH DISPOSAL UNDER THE PAST LAW AND  
THE PRESENT FOREST PROTECTION ACT

Early History.

The state of Oregon has been cooperating in one way or another in fire protection with private individuals since 1907. This was the beginning of Oregon's State Board of Forestry. While this first organization offered fire protection, there was nothing concerning the disposal of slashings. In 1911 the State Legislature of Oregon passed the first law directly concerning hazard reduction. It was to be administered and enforced by a State Forester appointed by the governor of the State. The field enforcement of the law was vested in District Wardens in the several districts over the entire State. This first law was, "Every one, by which is meant every person, firm, or corporation engaged in logging\*\*\* in this State, shall each year burn their annual slashings" (5).

The Effect of the Early Law.

As the law merely stated that slashings must be removed, it can be readily seen what resulted. The law did not specify how to reduce the hazard, when to do the work, in what conditions lands were to be left, nor how much disposal was necessary. It did specify that ordinary precaution must be taken in burning to safeguard property adjacent to such areas. This has given the private owners every opportunity to do as they saw fit. Wardens put pressure upon the owners to rid their property of the hazard. The result has been the

indiscriminate burning of many thousands of acres bringing about the ultimate of destruction to excellent reproducing areas. Enforcement of the law together with the prevailing ideology of land use resulted in broadcast burning Ponderosa pine lands. The objective of the land owners and the law enforcement officers was to get a "good burn" irrespective of other values harmed.

The initial law was formulated for the excessive hazard created by slashings in the Douglas fir region west of the summit of the Cascade mountains, but it has been carried over and enforced on all of the private lands of Eastern Oregon. While this law may have applied on the slash areas in Western Oregon, it has been one of the primary detriments to sound forest practice on the pine lands.

#### 1925 Revision of the Law.

Recognizing the unwisdom of the basic law and further recognizing that antagonism was being drawn from the United States Forest Service and many private individuals over the entire State of Oregon, it was changed by legislative action in 1925 to read, "Every one, by which is meant every person, firm, or corporation, engaged in logging or woodcutting, or permitting logging upon his lands in this State, thereby creating a fire hazard, shall each year remove his annual slashing, unless relieved by the State Forester.\*\*\*\* Further, that where in the opinion of the forester such burning is unnecessary, or will create a fire hazard, he may relieve by written authorization such person, firm or corporation from the above requirements with respect to part or all of the



operation area"(6).

Since the revision of the law there has been a decided trend toward better practice on the private lands of Eastern Oregon, but in some of the Districts practices are still being recommended that are merely reflections of the first disposal law.

The modifications and the flexibility of this revised law are directly in the hands of the State Forester. If the Forester is rigid and believes in exacting protection, then the law will be little modified. If the Forester recognizes the various problems and issues to be evaluated in making slash disposal decisions, then the law is apt to be flexed to the limit.

#### Slash Disposal Under the Present Law.

In order to carry out the slash disposal law under its 1925 revision, an extensive system has been worked out by the State Forester. The necessary modifications and flexibilities can only be made when actual conditions are known for each slash area considered. This requires field information which the State Forester secures from his inspectors and wardens in the several protective units.

The inspector in the Oregon State Forest Service for Eastern Oregon is the actual field man in charge of slash disposal. He inspects each slash area within his district, makes the recommendations for disposal, contacts operators and owners concerning their recognition of the added responsibility of the slashings. When this information is

secured, it is forwarded to the State Forester. It is here that much depends upon the inspector for making the proper recommendations. He must be capable of realizing the hazard, the need for reproduction preservation, the grazing value, and all of the considerations of sound forest practice. If the inspector has grown over-balanced on the protection phase, then "good burning" is still practiced. If the inspector is technically trained in the art and science of forestry, then the proper modifications and flexings can be recommended by him to the Forester. There have been numerous instances where the inspector has recommended drastic burning measures which have spelled destruction to reproducing pine areas. It is true that the inspector is limited under his delegations, but is generally directly through the inspector that the State Forester is able to modify the law where needed. It is a job where one may practice forestry indirectly upon the lands of the private owner. Many owners would gladly do nothing with their slashings if pressure were not exacted upon them by the inspector.

The district warden generally has little to do with the actual field work and study. He does have, though, a tremendous voice and part in slash disposal practices. All recommendations made by the inspector must be agreeable to the district warden. In other words, releases of responsibility to the land owners are made only when they are agreeable to the warden. If an area has been burned over, but the burning does not meet the approval of the warden, then the owner is

held for the excess risk until the hazard is further reduced. It is here that most of destruction to Ponderosa pine lands has emanated, due to the inflexibility of the district warden. Most wardens of the past, and also many of the present, are essentially fire protection men. They have grown up through the ranks as fire fighters, and think only in terms of hazard reduction. Fire takes precedent over all other considerations. It is only when a slash area is scorched and blackened that the warden feels he has accomplished desired results. This is not entirely the warden's fault, because it must be remembered that fire protection is his job. It is to his material benefit to do his job well and to keep fire costs to the minimum.

It is impossible for the State Forester to modify the law unless he gets the correct facts from the field. District wardens who understand the consequences of destructive burning and are fully cognizant of the residual values on cut-over areas are better able to make the proper decisions. Private owners are constantly under pressure from the wardens to reduce their hazard, and the result is "hard burning". Wardens must be more flexible and more willing to assume the responsibility of the excess hazard. They must expect that suppression cost on these areas will be somewhat higher. They cannot expect to carry on as foresters by practicing slash disposal methods out of line with sound forest practice. More time must be spent cooperating with private individuals trying to keep and preserve their residual values than in



putting pressure on them for exacting hazard reduction.

Classifications of Responsibility.

Slash areas are classified as to the responsibility of the land owner or the State of Oregon. These are: Current slash areas, Hazard Removal Extension areas, Exempted areas, Release areas, or Illegal areas. These are made by the State Forester in his exercise of the modification of the revised law of 1925.

The inspector makes what is known as his first slash inspection in August or the early part of September of each year. Every operation is located by legal description and mapped. The inspector is generally accompanied with the operator or land owner. The future use of the land is ascertained from the responsible party and then the necessary recommendations are made as to what to burn, how to burn, when to burn, and what precautions to take. When these recommendations have been thoroughly gone over by the inspector with the land owner or operator, the responsible party acknowledges the responsibility by affixing his signature to the inspection report. It is at this time that all currently logged areas are classified as current slash, which places all slashings under Sec. 42-421 of the Oregon Forest Laws.

After the burning season is over in the Fall of the year and it is quite definitely certain that further burning is impossible, the inspector makes a second inspection of all the previously inspected areas. The areas are mapped

and reclassified. All lands cut after the burning season are classified as current slash for the ensuing year. The other classifications are made by the district warden and inspector, which are either hazard removal extensions, exemptions, releases, or illegal areas.

The hazard removal extension is a formal indication between the State and the responsible parties that an extension of time is desired in which to reduce the slash hazard. It is to be requested by the responsible party and is recommended by the inspector, to be in force, generally, up to the burning season of the following year. There are several reasons for which the operator or owner may request an extension of time, as: (8) Logging equipment within the slash area; logs not yet removed; only partially cut with balance to be taken out during the next year; selective cutting in second growth where the accumulation of slash is too great to justify an exemption; areas which have been spot burned at a time when brush was too wet and hence hazard not sufficiently reduced; inability to burn due to unfavorable weather; operator or owner desires to carry on additional salvage activities. Some owners have made requests for further time because of an anticipated U.S.F.S. land exchange. The Forest Service oftentimes will not exchange timber for lands that have been indiscriminately burned.

Classifying an area as a hazard removal extension does not relieve the responsible parties of their obligation of



taking care of the excess hazard left by the operation. This merely keeps the current slash on a legal basis for the specified period of the extension, indicating that for some good reason the owner or operator was unable to reduce his hazard as was indicated for him to do on the first slash inspection. This places the responsible party directly under Sec. 42-421 of the Oregon Forest Law, but prevents the areas from being classified illegally and the responsible people from being in violation of the Forest Protection Act. This means that the land owner agrees to accept all responsibilities as provided by law for the protection of, and fire suppression on, his slash area until the hazard is sufficiently reduced and a release is issued by the State Forester.

The hazard removal extension is formally indicated by an instrument drawn up by the inspector and signed by both the inspector and the responsible party and approved by the State Forester. This is a contract between the State and the parties involved. The contract indicates by map the legal description and other pertinent information, the names of the operator and land owner, the acreage, year slash was created, what work has been done previously to the slash, such as trailing, snag-felling, or burning done, period of request, reasons for request, additional protective requirements during extension, recommendations of inspecting officer, and the signatures of the owner or operator, the inspecting officer, and the State Forester. Copies of this contract are held by the State Forester, the district warden of the district, and



the land owner.

Extending the time for disposal for a year permits the natural disintegration of the slash. By the end of the period of extension the inspector may require the hazard to be reduced or he may recommend that a new extension be granted. In this way extensions may be given for such a length of time that the hazard may naturally reduce to the point that a release can be given the owner. In this way the hazard is carried by the owner and the State. It relieves the owner of exacting pressure of violation of the Protection Act, it eliminates destructive burning, and brings about better forest practice.

Slash exemptions are rarely used on the pine lands of Eastern Oregon, mainly because the volume of slash left after clear cutting is thought too heavy to warrant their use by the protection personnel. Exemptions are offered where the slash is very light as in selective logging areas. They are also used for areas which have been carried on extensions until the hazard has naturally receded to normal risk, or on old logged areas which were never under classification. The hazard under exemption is thought to be normal enough that the State can carry it as a normal risk. It depends upon the State Forester and his inspectors and wardens as to how much added responsibility the state will accept. Exemptions should be used on many of the private lands of Eastern Oregon, especially on the scattered, park-like stands where slash is isolated in small patches. The land owner or

operator is not held for the extra hazard when the area is exempt, and, therefore, does not violate any part of the Forest Protection Act.

When the hazard on any slash area has been reduced as provided by Sec. 42-421 of the Oregon Forest Law, the inspector may recommend a release, either by request of the responsible parties or upon his own initiative. A release is a formal acknowledgement from the State Forester that the parties involved are released from further responsibility, in so far as the extra hazard created through operations is concerned and that hereafter such lands will have the same classification for fire protection as carried prior to the operation.

A release is granted only upon the recommendation of the inspector and when such recommendations are agreeable to the district warden. In many cases the inspector and warden will not recommend a release until the areas have been thoroughly burned, meaning that destruction has followed in the wake of such practice. Other cases, the inspector feels that the area should be released, but the district warden wants "good burning" practiced, and consequently will not o.k. the recommendations. A great deal of the destructive burning of the past has been due to over-balanced protective personnel putting pressure on the private individual to burn the areas well before a release will be granted. The flexibility of the law rests in the hands of the inspectors and the wardens. Areas may be released with little or no burning done with



the maximum of residual value preserved, or they may be indiscriminately burned before a release will be granted.

Slash areas which have not been burned nor any attempt has been made to reduce the existing hazard by trailing or snag-falling are classified by the inspector as illegal slash areas. This classification places the parties involved or responsible in direct violation of the Forest Protection Act. The liability of the private owner is stated in Sec. 42-428 of the Oregon Forest Laws that: (6)

"In addition to the penalties provided in this act, the United States, state, county, or private owners whose property is injured or destroyed by fires in violation of this act may recover in a civil action double the amount of the damages suffered if the fires occurred through wilfulness, malice or negligence. Persons, firms or corporations causing fires by violations of this act shall be liable in action for debt to the full amount of all expenses incurred in fighting such fires."

Wardens and inspectors use this section of the law as a club over the heads of the land owner and the operator to get areas burned. If areas are not burned well enough, the warden or inspector classifies the slash as illegal. Under these circumstances the average land holder will make every attempt to rid the hazard regardless of what condition the land may be left. Large operations are better able to take this excessive risk than small operations. Many of the large operators or owners maintain a protective organization for their own holdings and thus are better able to give added protection to illegal areas. Also, the illegal slash area may be well within their own holdings and isolated to such a degree that fire is not apt to get to or injure other persons'



property. This is not the case with the small land owner. A single fire on a small tract may get out of bounds and injure and destroy another's property. If the fire is shown to have been due to excessive hazard on an illegal area, then the person having this illegal slashing is subject to the penalties of violation of the Fire Protection Act. No small land owner can take this risk, and consequently makes every attempt to reduce this hazard to such an extent that a release will be granted them by the State Forester. Many wardens and inspectors are able to get slash areas burned well by emphasizing this law. It brings about hazard reduction, but it works negatively for forest practice. It is a drastic law and unless enforced with the proper flexibility, which it has not in the past, sound forest practice on the private lands is impossible.

## SUMMARY

### Findings.

The area concerned is significant. There are over 3 million acres of private pine lands under the State Forest Protection act. 90 per cent, or approximately 90,000 acres, of all pine lands cut over each year are from the private lands. It is shown that this land is of the best timber growing land in Eastern Oregon because of its quality, moderate topography, and accessibility. It is primarily suitable for tree growth rather than for agricultural purposes.

The situation is complex because of the diversity and size of ownership. There is no central thought concerning the best methods to use for improving forest practice on these lands. Slash disposal practices have largely been the result of pressure put upon the owners by law and State fire protection personnel. The ideology of the people has been for immediate value and not for conservation.

Destructive practices have emanated from past laws: Residual growth has been severely injured or destroyed on many areas; soil has been eroded because of the lack of vegetative covering; grazing values have decreased because of the presence of adverse plant successions and the elimination of certain forage grasses.

The fire hazard on many of the areas has been more apparent than real. Volumes of slash are sometimes heavy, but methods of logging arrange and distribute the slash by the presence of skid roads and truck roads to the extent

that hazard is materially decreased. Many of the slash areas are far removed from other bodies of debris, reducing the possibility of disastrous conflagration. The combustability of the slash recedes quite rapidly; after 5 years certain protective organizations are willing to accept the hazard as a normal risk. None of the disposal methods now used by private owners reduce the hazard to any large extent, and often, if extreme care is not used, the hazard may be two to three times worse after a few years than the original slash presented.

The future productivity of the land is enhanced by the presence of undisposed slash. Reproduction is benefited. The soil is built up by decaying matter and is protected from erosion. Grazing is kept status quo; grasses are unharmed; adverse successions are eliminated.

Because of high taxation, low prices of lumber and logs, and the desire to liquidate, the private owner spends as little as possible for slash disposal. Owners still have the ideology of immediate value, and have not realized the importance of conservation.

Past and present disposal methods are largely due to inappropriate slash disposal law and over-balanced fire protection personnel. Good burning has been the sentiment, rather than good forest practice. Past law enforcement has been too inflexible, and present practices are far from giving the desirable results. Wardens and inspectors must realize the importance of the other considerations than



fire protection. The modifications and the flexibility of the law is in the hands of the State Forester and his personnel.

### Conclusions.

Slash disposal on the private lands of Eastern Oregon has been over-emphasized by the law and more so by those administering and enforcing the law. Over-ambitious fire protection personnel, in order to increase their own personal advantage by keeping fire protection costs to the minimum, have over-looked the consequences of destructive burning practice. Wardens and inspectors can indirectly practice forestry on the private lands of Eastern Oregon by proper evaluation of hazard reduction and the other residual values, and then making the proper recommendations. Slash disposal has only one purpose and that is fire protection. If intensive protection can be given the areas rather than burning over areas indiscriminately, then forest practice on the private lands is going to improve. Rather than indiscriminately burn all the areas in an attempt to reduce hazard and at the same time reduce some or all of the residual values, it would be much better to assume the risk and expect to spend a little more for protection of such excess hazard areas until such areas have returned to normal conditions. The State of Oregon is in a position to accept this increased hazard with little added expense.

This added responsibility of excess hazard, while it is on the owner's land and is his creation, should not fall

entirely upon the owner. Both the public and the state directly and indirectly use these lands. Recreationists, public ways-of-travel, and all other public uses these lands may have are partially responsible for the hazard that slash areas present. It is to the particular benefit of the government and state that our lands be left in a productive state and that their values be perpetuated.

#### Recommendations.

It is recommended that the State of Oregon acting through the State Forest Service accept more of the responsibility of the excess hazard on the current logged lands of Eastern Oregon. If the increased responsibility necessitates more funds than the regular fire protection tax affords, then moneys should be taken from the general fund of the State Treasury. This would place some of the increased burden upon those people who are not directly concerned but indirectly gain benefits from the use of these lands.

It is further recommended that the United States Government share more appropriation for their interest in these private lands.

There is a direct need for technically trained foresters in the State Service, men who have been trained in the art and sciences of forestry. And, to make the organization more stable and permanent, the organization must come under a civil service system.



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