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Reports

June 15, 1911

DISTRICT FORESTER'S ANNUAL REPORT, FISCAL YEAR 1911

DISTRICT 6

THE NATIONAL FORESTS

Area

Claims and Settlement

The amount of land within the National Forests passing to private ownership through the perfecting of entries initiated before the Forests were created has appreciably decreased. This is mainly due to the fact that most of these claims have now been adjudicated. The most notable event in status of lands inside the Forests is that in the U. S. Circuit Court for the District of Oregon, in the case of U. S. vs. Oregon and California R. R. Co., et al., the Court decided in favor of the Government by overruling the defendant's demurrer to the bill of complaint. This suit was instituted in 1908 for the purpose of securing the forfeiture of 2,373,000 acres of land, valued at approximately 75 millions of dollars, located along the Southern Pacific Railroad in Western Oregon. A large amount of this land lies inside the National Forests.

The opinion of the Solicitor of the Department of Agriculture to the effect that lands listed with the Secretary of the Interior under Act of June 11, 1906, are practically eliminated from the National Forests and that no authority exists for allowing the examining and reporting on these claims by the Forest Service, has served to decrease the claims work.

Examinations and reports on claims have been made largely by the local Forest forces. One expert miner has been employed for 10 months on mineral cases and 2 coal experts were employed during the summer months. Of 50 squatter claims examined in one body on the Oregon Forest on heavily timbered land, it has been found that the claims were nearly all fraudulent, in that settlement was not made until after the withdrawal of the land from entry.

Attempts are being made under the public land laws to obtain fraudulently both land valuable for timber for speculative purposes and for medicinal springs. Such lands have been located under the mining laws and contests have been recommended by the

Forest Service in several such cases, the recommendations being based on filings of experts employed by the Service.

Governor West of Oregon, has expressed a desire to have State lands within the National Forests of Oregon, exchanged for National Forest lands and all the State holdings placed in one body in the Cascade Mountains, for the purpose of a State forest. Congressional legislation being necessary for such exchange, no action could be taken on this and similar requests.

Applications under Act of June 11, 1906, have been acted upon with reasonable promptness, the necessity of protection against fire causing some delay in the dry summer months when it is necessary for every available man to put his undivided attention to the prevention of destruction of the forests by fire.

Information gathered by the Forest Service shows that about 50% of the claimants who have settled on land under the Act of June 11, 1906, have maintained continuous residence since settlement and have shown good faith by residence and cultivation. This shows that homes are in fact being made on lands entered under the Forest Homestead Act, since the information is necessarily incomplete as many of the claims have not been opened to entry for a sufficiently long period to enable claimants to show their good faith beyond doubt. On the other hand, applications are still being received on lands chiefly valuable for the timber, in other words, lands which if opened to entry would eventually pass into the hands of timber holders and be held for the value of the timber. Every effort has been made to prevent timber speculation in lands listed under the Act of June 11, 1906, and lands supporting a stand of timber have been listed only in cases where the chief value was undoubtedly in favor of agriculture. In Northeastern Washington, lands have been listed supporting a stand of 5 M. per acre on the average over considerable areas. These lands have been settled upon and homes are being made. The most difficult problem is still that of the level agricultural lands of value supporting a very heavy stand of timber. As rapidly as possible such land are being classified and timber sales solicited in order that the timber may be removed and the lands opened to settlement. The Forest Homestead Act has now been in operation 5 years and as a consequence practically all the lands which can be opened to entry on certain Forests have been so opened.

Legislation is badly needed amending the Act of June 11, which will give the Secretary of Agriculture authority to fix the area of a farm unit for large tracts of land eliminated under the Act of June 11, if the Act is to accomplish its full purpose. A provision in the homestead law allowing a settler 160 acres of land was inserted in the original Act by Congress at a time when the public domain contained millions of acres of land and when it was necessary, in order to get it settled, to offer very great inducements to the farmers of the East and to possible immigrants. In recent years Congress increased the area of lands which could be obtained under the homestead act for arid lands in the Rocky Mountains States, owing to the fact that different methods of culture had to be used on such lands and a larger area than 160 acres was actually necessary for the settler to make a living. When the Reclamation Act, however, was passed by Congress,

it gave authority to the Secretary of the Interior to fix the area of the farm unit, since a very small area of irrigated land would support a family in comfort. Under this provision of the Reclamation Act the Secretary of the Interior has fixed the farm unit on some projects at as low as 20 and 40 acres. This policy has proven a very wise one since it prevents speculation and insures the most intensive methods of cultivation and in consequence the highest use of the land.

We know there are large tracts of lands within the National Forests of western Oregon and Washington which will be more valuable for agriculture when the timber is removed. The Act of June 11 as it stands at present, allows 160 acres to each applicant. If the tracts of land mentioned above are listed under this provision, the very purpose sought to be accomplished by the Act will fail to be obtained. In the first place, material development of the land listed will be greatly retarded since the clearing of the land is very expensive and slow process; one or two acres a year being a good average for a single settler. The lands listed will have a value of at least $20.00 per acre and the settler would find that it will pay him simply to comply with the letter of the law until title could be obtained and then sell. A large number of the settlers would hold large portions of the land at exorbitant prices and it would be many years until all the land was put under cultivation. On the other hand, if the amount of land allowed to each applicant was placed at about 40 acres, only bona fide settlers would be apt to file and the land would be put in cultivation in a few years. Further, the fact that there would be four times as many settlers upon the land than there would be under the present provision of the Act, would surely mean more rapid development. There would be greater incentive to the development of transportation facilities, and there would also be more villages, schools and other educational advantages.

To summarize, as the Act stands at present the listing of large tracts of cut-over land would mean a large slow agricultural development and the maximum of land speculation; while a reduction in the size of the farm unit would insure the most rapid development of agriculture, transportation, trade, and educational facilities. It seems apparent therefore that strong effort should be made to have Congress amend the present Act so that the Secretary would have authority to fix the area of the farm unit.

ENFORCEMENT OF LAW

Cost and Use

An important practice has been initiated in granting the use of National Forest lands under Act of February 28, 1899. This Act gives authority to lease lands adjacent to mineral springs within National Forests. A form of lease has been approved by Secretary of Agriculture and it is believed such a lease will be a strong inducement to capital to adequately provide for the erection of sanitariums and recreation resorts within the National Forests. Such leases may be assigned.

An increased use has been made of the National Forests for recreative purposes. It is quite fortunate that ideal areas for summer outings are found within the National Forests

where the use of the public can be regulated by special use permits for small areas, reserving sufficient land from private appropriation for the use of the public for recreation. Such lands are now being used largely on the Olympic and Columbia Forests in Washington and on the Crater Forest in Oregon. Certain areas have been carefully surveyed out, the side of lakes being used largely for recreation purposes, for lots, on which special use permits are issued for residences. Large areas suitable for the general public are reserved for such use.

The new water power regulations which went into effect December 29, 1910, have been on the whole very favorably received by applicants for water development. Several applications have been received for both preliminary and final permits. At the present time there are 32 cases in this District for which permit has been issued or the application for permit is completed. In addition there are 13 unperfected applications. Of the 32 cases for which permit has been issued, 9 are operating plants, and 7 are plants under construction. A thorough investigation of the water power conditions and possibilities in the District has been started, and is now well under way.

EXECUTIVE FORCE

Just so far as possible the efficiency of Forest officers has been increased in educational lines by stimulating courses of study in forestry. A few books upon forestry were recommended for reading by the Rangers during the winter months, as a result of which over 100 rangers actually studied the books. During the past winter 23 men, including rangers and guards, attended the ranger school at the University of Washington. Lectures were given on the various lines of National Forest work in this school by members of the District office in addition to the regular teaching force. The lectures given by District officers were mimeographed and sent to every ranger in the District, thereby presenting to every Forest officer a more complete compilation of instructions and a larger discussion of National Forest work than has been presented heretofore.

No Supervisor or Ranger meeting was held in the District during the fiscal year on account of lack of funds occasioned by the serious fire season. Since, however, these meetings were held in the previous fiscal year it is not believed that the inability to get the men together this year for consultation will be a serious drawback to the work.

BUSINESS ORGANIZATION

FOREST MANAGEMENT

Stand and Distribution of National Forest Timber

The total stand of timber on the National Forests in District 6, is estimated to be approximately 287,202,000,000 feet board measure, including timber on the two National Forests in Alaska, which is estimated roughly to be 69 billion feet. This

estimate is based to a small extent on careful cruise in which 5 to 10% of the timber area was covered, but to a much greater extent on calculations based on the forested acreage and average stand per acre.

Losses by Forest Fires

The fire season of the calendar year 1910, was without a doubt the most disastrous in this District since the establishment of the National Forests. Not one but many disastrous fires occurred on National Forests, and privately owned timber lands suffered as well. Losses in improvements, such as saw-mills, houses, etc., reached a total of $1,913,502. It must be stated, however, that the timber land owners organized a patrol and carried on a more effective fire protection system than ever before in the history of the Northwest. The Washington Forest Fire Association, composed of large timber owners in Washington, has for several years patrolled the holdings of its members in a manner similar to the Forest Service patrol. This organization has surpassed the Forest Service in the intensity of its patrol, spending directly last year about 2 cents per acre, which, added to the indirect charges made a total of from 8 to 10 cents per acre, as against an average of 7 mills per acre spent by the Forest Service in Washington and Oregon. In Oregon the private interests while not as well organized at the beginning of the fire season, probably expended as much per acre. Although on the whole both private, State and Government interests were in better condition to effectively protect timber wealth, the loss by fire was greater than in any recent years. The increased loss is primarily due to climatic conditions; the small amount of snow which lay in the mountains early in the Spring rapidly vanished in the dry hot weather, making the fire hazard by far greater than in former years. Consequently it is indeed fortunate that an organization of increased efficiency was on hand to cope with the situation. The water precipitation of the Spring of 1910 was abnormally low. In addition there was practically no rainfall during July, August and September. As a consequence, the woods were in a highly inflammable condition so that burning embers falling on the decayed bits of wood immediately caused the dry litter to father a blaze. In addition to the great heat and dry condition of the material, high winds rapidly fanned fires into raging conflagrations. A great many fires were reached while still in the incipient stage. These were easily checked whenever conditions were favorable. However, fires starting in down timber, after having covered one or two acres, could not be trenched rapidly enough by the crew of men to be put under control. Consequently, a great deal of back firing was absolutely necessary, the only question of judgment being what point to back fire could be most advantageously started. Ground fires often developed into crown fires in the high winds, consequently back firing itself was, in certain cases, almost impossible owing to lack of time, since the crown fire travel at the rate of several miles a day.

The fire season opened in April with two fires in Northeastern Washington on the Colville Forest. Beginning early in July the situation on some Forests began to be serious, until in August the fire situation was particularly serious on the Colville, Whitman, Wallowa and Crater Forests. On the above Forests it was necessary to call in all obtainable aid; the War Department furnishing about 500 men from their enlisted forces. With the assistance of the soldiers, together with all the temporary laborers

which were assembled as quickly as possible at the different points of danger, the fires were in nearly every case extinguished before rain came. Although the loss was great the actual cost of fighting is almost insignificant when considered as a charge against the valuation of the heavy stands of timber which were actually saved from destruction.

When in its most serious condition, the fire situation showed a marked weakness in the Forest Service organization. The area to be patrolled by each Forest officer was so large that whenever several fires started in one Forest officer's district, it was necessary to neglect some of them at least temporarily. This lack of efficiency to cope with the situation is of course due to lack of funds. An efficient Forest fire organization must extinguish fires in their incipiency. This can be done only when the territory to be patrolled is small enough to allow of immediate discovery of the fire. It is believed that fires could have been kept out of the National Forests with practically no loss of timber had the funds which were paid out by deficiency appropriation been available for patrol early in the fire season.

It is very important to report that because of awakening public interest in the preservation of the timber wealth of Oregon and Washington, marked progress has been made during the year in advanced Forest fire legislation, and in the formation of associations of timber land owners particularly in Oregon. During the year both Washington and Oregon placed progressive forest fire legislation on their statute books, backed with substantial appropriations to effect an enforcement of the law.

Cut of National Forest Timber

The cut of National Forest timber in District 6, during the fiscal year 1910 was 72,602,000 feet B.M. Of this amount about 17-1/2% was cut under free-use permits. It is evident that the timber cut from the Forest can be increased each year to a great degree without impairing productive capacity. Based on the present stand of timber and the estimated rate of growth two and a quarter billion feet could be cut each year with safety. Since, however, the amount of timber cut is regulated by the laws of supply and demand, it is clear that the cut can not immediately be increased to the annual yield. The lumber market has been sluggish mainly because of over-production. A great number of saw-mills are in the hands of creditors who desire to keep them operating in order to obtain some money returns until better times shall come. While a good price is still received for the higher grades of lumber, the good grades are being sold at a price lower than the cost of production. In spite of this condition of the lumber market there has been an increase in National Forest timber sale business during the present year. This increase is present mainly in particular localities where conditions are more than usually favorable for timber exploitation. The chief increased demand has been for western yellow pine on the East side of the Crater National Forest in Southern Oregon.

Much difficulty has been experienced in attempts to sell the timber killed and damaged by the fires of 1910. This is a result of both the inaccessible locations of much of this timber and the poor demand for logs. The largest amount of such timber in any one locality aggregates 134,500,000 feet B.M. located on the Crater National Forest in

Southern Oregon. Many miles of logging railroad will be necessary to secure its removal and no sale has been made although it has been advertised at a low figure. Small bodies of fire-killed timber have been sold.

The aim in National Forest management is to cut first those bodies of timber which has passed maturity and have begun to deteriorate. The disposal of this class of timber, however, is dependent upon the demand for it and although for some time accessibility will govern the location of a good many of the sales, the cutting in such sales will usually be in stands which are over-mature and decadent. This is because there is such a large amount of timber of this class on the National Forests. The western yellow pine stands include a relatively large proportion of timber which has passed maturity and which is ready for the ax. In the Douglas fir stands the proportion of over-mature and decadent timber is relatively large. Reconnaissance studies have disclosed the fact that on the Olympic and Snoqualmie National Forests in Washington 89 to 92 per cent, respectively, of the total area of accessible merchantable timber is over 200 years old. It is highly advisable, therefore, to cut these older stands of Douglas fir timber in order to secure a proper distribution of age classes for the purpose of making possible a sustained annual yield during the second and following rotations. This must be done to prevent the sacrifice of volume production in these rotations.

In cutting these mature stands the construction of many miles of logging railroads will be necessary. In order to encourage purchasers to incur heavy expenses in exploiting the timber in this manner special inducements must be offered. Large amounts of timber will have to be placed under contract in order to justify the great outlay of capital. Longer periods than five years will be necessarily required for the removal of the timber, and in some cases it may be necessary to make a reduction in the stumpage price or at least in the price of timber cut during the first few years of the sale. In determining how much the stumpage should be reduced in a sale of a part of the timber on a watershed where the proportion of privately owned timber on the watershed is insignificant, the whole body of timber tributary to the railroad should be taken into consideration. In other words, the cost of the railroad should be charged against all the timber tributary to it and not merely against the first sale of timber on the watershed.

Several new railroads have been projected and are now under construction, particularly in Oregon, which will open to exploitation large bodies of mature National Forest timber. The time is not far distant when not only will the National Forests receipts pay all expenses but even exceed this amount.

Timber Trespass

Free Use of Timber

Reforestation

More than double the area planted in any previous year was planted this fiscal year; 10,000 acres in all were artificially reforested, three-fourths being on the West side of

the Cascade Mountains where the growth per acre of timber is greater than in any forests in the world. Since the seed crops of native species was a failure, it became necessary to obtain large quantities of seed of exotic species. Most of the sowing was done in the fall as a result of the previous year's operations in which both fall and spring seeding were tested, and in which fall seeding showed to much greater advantage. In addition to the information gained from these experiments, however, the character of the climate both east and west of the mountains was considered presumptive evidence that sowing in the fall and winter would give better results than spring sowing. The climate throughout the whole district is characterized by more or less heavy precipitation in the fall and winter, with a corresponding period of drought in the summer. The dry season in many localities follows within a short time after the disappearance of the snow, so that seed sown in the spring frequently has unfavorable conditions under which to germinate. If it succeeds in germinating, the young seedlings are killed by drought before they become well established. On the other hand, seed sown in the fall undergoes, during the winter, the preliminary steps in the progress of germination, such as absorption of water and softening of the seed coat, and as soon as temperature conditions become favorable in the spring, it germinates readily. The advance in time thus gained by the seedlings from seed sown in the fall over that of seedlings arising from spring sown seed, increases their powers of becoming well established before the dry season begins. Apparently, also, there is less danger of the seed being eaten in those regions where rodents are abundant when the seed is sown in the fall or winter, than when sown later in the spring. The majority of the rodents withdraw into their holes at about the time or soon after the seed is sown in the fall and do not appear again until spring, when the seed is germinating. Moreover, the covering of snow aids in the protection of the seed. There is still another advantage arising from fall seeding in that the seed is brought into closer contact with the mineral soil through the action of snow and rain. Where the seed is merely broadcasted upon the surface, this action of the elements is often sufficient to bury the seed, thereby making conditions for germination increasingly favorable.

There is both need and opportunity for extensive artificial reforestation on the west side of the Cascade Mountains, and I strongly believe we should concentrate the work there, enlarging the scope of our operations from year to year as conditions will permit. Our experience last season shows that in extensive operations we can reseed at a cost which is sufficiently low to make it financially profitable. Moreover, in the near future, probably in the coming year, there will be portions of timber sale areas which have been conducted under a system of clean cutting which will be ready for reforesting either by seeding or planting. That we will continue to have some failures I have no doubt, for as I have stated above, the factors which influence the results of direct seeding are so multitudinous that we can hardly expect to achieve success in every operation. As the quality of our seed improves, however, and as our knowledge of essential requirements increases, we will continue to obtain results more and more satisfactory.

Stream flow Studies

Stream measurements are being undertaken within the National Forests just so far as funds will permit, a large part of the work being done by and under the supervision of the Geological Survey. There are now approximately 40 regular stream gauging stations established in the District. The stream measurement work serves a two-fold purpose in that the data is valuable not only for water power purposes, but for the purpose of determining the relation between stream flow and Forest cover.

Other Studies

Much progress was made during the year in a rough cruise, or invoice taking of the timber on the National Forests. This work is absolutely necessary to the practice of forestry. The data obtained is used to devise plans for cutting the crop according to proper forestry management.

The tabulation of the data collected in the study of Douglas fir has been completed. This information is very valuable in introducing forestry in the Douglas fir forests which form the larger part of the timber wealth of Western Washington and Oregon, where it yields the heaviest forests in the world. A study has also been made of silvical habits, growth and yield of yellow pine, another important timber tree of the Northwest and forming a bulk of the timber supply of Washington and Oregon, East of the Cascade Mountains.

A study of avalanches has brought out the conclusion that the slope-slide type of avalanches, such as caused the great destruction at Wellington, Washington, is possible only when the forest cover has been destroyed. Efficient fire protection and reforestation will therefore decrease the occurrence of avalanches.

Owing largely to the number of advocates of the light burning theory as the best means to prevent forest fires, a study was made of such surface fire to determine the amount of loss resulting from them. The data obtained shows most strikingly the large number of trees which are either burned down or are fire-scarred by such fires. The serious effect of light surface fires is particularly apparent in yellow pine forests. These figures show quite conclusively that a timber owner whether the government or a private individual can not afford to allow surface fires, much less purposely fire the ground to dispose of the accumulated litter as a protection against future fires.

A study of the bark beetle infestation in the Blue Mountains of Eastern Oregon has been made in cooperation with the Bureau of Entomology. Serious conditions were found only on two Forests, the Whitman and Wallowa. Active measures have been instituted to control the pest by cutting and burning up the infected trees.

Range Management

As a general rule it is possible to control without difficulty the handling of sheep range. The manner in which sheep are handled permits a field supervision in which systematic

cooperation between Forest officers and owners is possible without inconvenience to the stockman.

With cattle it is somewhat different. Owing to the firmly-rooted belief that the old method of simply turning stock loose to grass without any attention whatever is the best it has been difficult indeed to secure general cooperation. I am pleased to say, however, that during the past twelve months the cattlemen have begun to realize the need for cooperative work and to recognize more fully the rights of other classes of stock to a use of the range. The result has been the formation of many organizations for the better handling of stock.

The sheep owners are also giving more personal attention to their business. They are influenced to a great extent by the general slump affecting their interest and feel the need for more intensive study of the business. They have evinced a desire to assist us in our work of range management. This increased attention will have the tendency to prevent encroachment and the filing of trespass charges. During 1910 many springs were improved on the range. There is still much to be done on all the grazing ranges of the National Forests to bring about a more even distribution of the stock but because of a limited and largely inexperienced ranger force the work must necessarily progress more slowly than we would desire.

Grazing Capacity of National Forests

The depression in the sheep business has operated to prevent the immediate utilization of the large unoccupied sheep ranges in the Colville and Chelan Forests. However, with wool at a higher price than it has been during the past year, it is hoped that these ranges can be stocked.

Range Conditions

At the opening of the season of 1910 everything indicated an exceptionally abundant forage crop. The spring opened early and during the lambing season the warm weather produced a growth of grasses that put all stock into excellent condition. However, the warm dry weather continued throughout the entire season. Very little rain fell in some sections and none at all in others until the middle of September. This resulted in a general drying up and shortage of forage in some localities before the season was very far advanced.

Reports show that the degree of shortage was greater on all Forests east of the Cascade range and heavies on those located in central and southern Oregon.

As a rule all Forests of the entire Cascade range from Northern Washington to Southern Oregon reported that although the effect of the dry season was generally felt the shortage was not so great as to cause much shrinkage in the condition of the stock or loss to the owners. The ranges of these Forests are usually higher than those of the

Forests to the east and whenever the rain did fall it fell on the Cascade slopes. In addition the allotments on these Forests are not so crowded.

Additional labor was required of the field officers in providing range in a few cases where there was danger of over grazing on the Colville, Wenatchee and Wenaha Forests in the State of Washington east of the Cascades. No difficulty was experienced and all owners were able to use the range throughout the entire grazing seasons.

In Oregon, however, the shortage was severely felt. In northeastern Oregon conditions were much the same as in eastern Washington; extra range was supplied. This could not be done to any extent throughout the Blue Mountain range; on the Umatilla, Deschutes and Fremont National Forests in particular, and many permittees were compelled to remove their stock early in the season and rent pasture on the outside.

The greater part of the sheep ranging on the Southern slopes of the Blue Mountain Forests and the Fremont are grazed during the winter months on the Oregon Desert. They leave the Desert early in spring because the water supply is at that time becoming short. Trailing to the foothills adjacent to the Forests they are lambed and are at the boundary ready to cross to their allotments at the opening of the season. During normal years it is possible to feed sheep on the Desert during winter months without feeding hay. This is so because all stock are compelled to leave when the water holes become dry; the grass grows during the spring and early summer and there is usually an abundance of old grass for winter use. The unusual, however, occurred last spring. The early growth of forage was better in the spring of 1910 than it was in former years and the stock was able to remain on the desert longer than usual; the owners in some cases, taking advantage of the abundance of feed to lamb there. Then followed the unprecedented dry spell which continued until the middle of September. The growing grass was mostly consumed and did not again grow after the stock left. Very little, if any, grass reached maturity. Although abundant and heavy rains fell subsequent to September 20 they only served to start a growth of forage sufficient to relieve temporarily the distress caused by the shortage. In central and southern Oregon the sheep went of winter ranges devoid of old grass. The results has been that many sheep owners have lost upwards of 50 per cent of their bands. The winter was not unusually severe but appeared so to stockmen because of the shortage of feed. Stockmen now realize that the desert is overstocked and that the ownership of ranch property is essential if they expect to succeed in their business.

The prospect of a severe winter with heavy losses caused many changed in ownership in the fall of 1910. Many owners having no winter range and no hay were reluctant to enter the winter and sold their bands. The prices obtained were low. In very few cases did they exceed $2.50 for ewes where a chance on the winter was to be taken. The prices were higher where the purchasers were able to provide against severe weather. As high as $6.00 per head for 1000 head of exceptionally good ewes were paid last fall in southern Oregon. These were range sheep grazed on and adjacent to the Fremont Forest. The market in general has been picking up since last summer. The cattle market has been strong for the past twelve months as compared with other years.

Lambs were sold for from $2.50 to $4.50 per head last fall and this spring at the May sales were bringing $6.50 per head. Wethers have averaged about $4.50 during the last six months. Many fall sales of wethers brought in $4.75 per head in the Portland market. The price of wool at the May sales in Oregon averaged 13 cents per pound and is much lower than last year when 21 cents per pound was freely paid.

The cattle ranges of all Forests with the exception of those in the Blue Mountain region and Fremont range have supplied forage sufficient to carry the stock through the grazing seasons. In central and southern Oregon there was a general shortage of range. This condition forced a good many sales last fall in that section of the District. Prices as everywhere in the two States, have been increasing steadily during the last two years and so much stock has been sold for export purposes that there are now about 12,000 head less cattle ranging in the vicinity of the Oregon Desert than two years ago. The rapid settlement taking place in this region has also contributed to this condition, the homesteading of the spring and fall ranges is causing large reductions in the herds of the larger outfits.

The present depression in the sheep business and good outlook for cattle, is creating a tendency toward a restocking of the cattle ranges on the National Forests by those who sold out during the past two years to become sheep owners. Applications have been received from some of these men for permission to change from sheep back to cattle.

Important Changes in Livestock Industry

Grazing Trespass

Judge Welborn's decision in the cases against Grimaud et al., erroneously reported by the press, had created an uneasy feeling among the stockmen throughout the District and there was much talk regarding the legality of the grazing charge and right of the Secretary to control grazing on the Forests. There were many threats of trespass but in most instances the Supervisors were able to satisfactorily explain the situation and to a great extent the agitation ceased. There were, however, a few restive spirits who either through ignorance or maliciousness took the chances of entering the Forests without permit.

The majority of stockmen fully understand the situation and the successful action in the cases before the Supreme Court this spring has cleared the atmosphere and conditions are generally very satisfactory at present.

Advisory Boards

The Central Fremont Cattle Grazing Association, comprising a majority of the cattle users of the Fremont National Forest has been formally recognized through an advisory board. The cattle men of the Rainier Forest have also taken the same step. These are two important organizations. Others have not gone so far but have formed associations for the employment of riders and the construction of drift fences. This is particularly

noticeable on the Deschutes National Forest where one association has erected a 17 mile drift fence, two others are taking up this work and all the cattlemen not enjoying the benefits of a fence have combined and hired line riders.

Permits

Use of State Lands

Use of Private Lands

The lands of the Weyerhauser Land Company in Southern Oregon have again been leased by the permittees of the Fremont National Forest and there will be a continuance of the amicable and very satisfactory arrangement of allotments on that Forest. The Northern Pacific Railway Company, which for the first time last year leased its lands within the Wenatchee Forest to Forest permittees has found the arrangement so satisfactory that the leases have been renewed for this year. It is apparent that these people desire to lease to our permittees, for clashes between users are thus avoided and when leases are once made, further trouble is practically eliminated for the year.

Numerous trespass cases originate from the use of private lands within the Forests. The growing demand for summer range on the Forests from bona fide settlers and the decrease in available public range on the outside has turned attention to the use of all private lands within the Forest. The owners, realizing that a value lies in the forage crop, are leasing these lands to stockmen. Stockmen desiring to increase or maintain their present status are anxious to acquire control of them. The result is today that very little, if any, private lands suitable for grazing within the National Forests are not being put to use during the grazing season.

Where this land is leased to our permittees we are able to cope with the situation but in cases of lease to outsiders a problem is presented. It is here we have difficulty with trespass and proof of encroachment necessitates much labor in ascertaining positively whether or not the stock involved is on the National Forest. Much of the private land has no section line boundary and in many cases where the lines of alienated land are ascertained the proper marking for further reference is not always kept in mind.

A more intensive development of the country and the consequent greater demand for range will demand that the boundary between private land and Forest land be clearly and plainly marked even though the private lands be within the exterior limits of the Forest. The pressure of business is increasing so that the rapid and complete preparation of all work is becoming most essential and every opportunity for the proper marking of the boundary of these private lands. I understand that the exchange of large bodies of private land is contemplated in the interests of more efficient administration. The large stockmen in this District who lease these lands are of course opposed to this idea, they fear elimination of the private lands if assembled in a body and consequent loss of protection.

Protection Against Disease

This spring the inspection of cattle in Lake and Klamath Counties, Oregon, showed the presence of scab to a great extent. Infected herds were quarantined by the State Veterinarian in the feed yards during the winter and instructions issued to have the cattle dipped before turning them out. The owners ran short of feed and as the cattle were poor and in no condition to dip they turned out on the range, the result being that both Lake and Klamath Counties were quarantined May 1. The order does not require a general dipping but merely calls for the inspection and issuance of a clean certificate before removed from the counties or from place to place in the counties covered by the order.

One or two owners desire to dip and are making preparations toward this end. Others do not want to go to the expense and should they not do so the result of dipping by others will be useless. The State should issue a general dipping order, compel dipping under State supervision each year for at least five years. One or two dippings will not get all the cattle and unless the State oversees the dipping it will never amount to much and the eradication of the disease will be impossible. Doctors Hamilton and Glazier of the Bureau of Animal Industry are at Silverlake investigating the situation in the interests of the Federal Government.

Protection Against Wild Animals

Predatory animals

With one exception no unusual damage to stock has occurred on account of predatory animals. The exception referred to is the outbreak of rabies in Eastern Oregon. The loss in stock was not heavy because of the immediate and vigorous action taken to prevent it. The Forest Service employed 8 hunters and the State of Oregon placed Dr. Lytle, State Veterinarian, in charge of the work, he also employing men to help in the work of extermination. Assistance was rendered by all stockmen who offered a bounty of $1.50 per head in addition to the State bounty of $1.50 for every coyote killed. Out best hunter, W.R. Hammersly, was transferred to the Wallowa Forest for four months, February 1 to May 31 and did excellent work. Three thousand coyotes have been killed in Wallowa County in the last six months and recently Supervisor Harris of the Wallowa National Forest reported that the rabid coyotes had been practically exterminated.

The greatest losses from the depredation of coyotes occurs among the sheep in Central Oregon. There the coyotes are very numerous and although our best hunters are stationed on the Forests adjoining the desert but little reduction seems to take place in their number. Hunters Hammersly and Canterbury of the Fremont Forest have each averaged one coyote a day since their employment. Hammersly has been on over two years. His kill for last January was 51 coyotes. Searcy of the Umatilla is another good man and is making a good record.

Loss from the attacks of bears are not heavy and but few large bears are killed. Most of the bears taken are small brown and black ones, generally considered to be harmless.

Protection Against Poisonous Plants

Losses from poison plants appear to be decreasing and it is believed this is the result of interest taken in the matter by the Forest Service. The stockmen are giving thought to better methods of handling stock, being influenced by the supervisors and rangers on the ground and through them are acquiring knowledge of the location and effect of poison plants on the stock under different systems of grazing.

The usual loss in sheep near Albert Lake on the Fremont Forest has not been so heavy this season as in former years. Since the investigation by the Bureau of Plant Industry last spring the sheepmen have paid particular attention to the movement of their bands over the trails from the desert to the foot hills of the Fremont range. It is hoped that the investigation being carried on by Assistant Botanist Eggleston, who is now on the ground, will discover the real cause of the loss and means for preventing it in future.

Forage and Pasture Investigations

The work of opening up the vast ranges in the Paulina Mountains of Central Oregon through summer grazing was taken up. These ranges are at present nearly useless because of lack of water for the animals. Unsuccessful attempts were made to reach water by boring with a well drilling machine.

It was found that owing to the igneous formation large caverns were encountered which could not be successfully pierced. Since if water is obtained it means the use of large amounts of range now being wasted, it is believed the work should continue until it has been demonstrated whether water can be obtained at a reasonable cost. The work done with the well drill cost in all $4,337.83 for a period of three months. This includes the cost of the drill and equipment and transportation to drilling site, which amounted to $2,228.33. The balance of $2,109.50 covered cost of labor, provisions, horse feed, horse hire and transportation of provisions and horse feed.

Five wells were drilled as follows:

No. 1	115 feet
2	70 feet
3	130 feet
4	60 feet
5	120 feet

The first four holes were abandoned on account of large seams and crevices being encountered in the lava. The tools went so crooked that the holes could not be successfully driven and they would not hold water to drill with. Work ceased on well No. 5 on December 1, 1910 on account of depth of snow and bad weather. The drilling

showed 43 feet of pumice and 77 feet of lava and was left in good condition to go deeper. It is at this well that work is now being resumed.

The total depth of the wells is 495 feet and no water. The cost per foot for last season's work, less price of drill and equipment was $4.53. We hope to reduce this in future work, for many disadvantages were met with which I think the experience of last fall will do away with this season. The plant has been strengthened to cope with the unforeseen character of the formations to be drilled through and success is looked for this year.

Some effective grazing reconnaissance work was done on Oregon, Cascade and Rainier Forests. A very good idea of grazing capacity of the various allotments has been worked out on these Forests. Owing to the busy fire season and lack of qualified expert men to take charge of the work, but little valuable data on an extensive scale was obtained on other Forests.

The coyote proof pasture experiment on the Wallowa National Forest was conducted in same manner as in former years with the exception that no expert was employed. Particular attention was given to gathering data relative to the difference in weights between sheep in the pasture and those on open range. The results show unquestionably that the method of handling sheep pasture distinctly increases the weights both of carcass and wool.

Game Preserves

In the early part of the year 1910 there arose much agitation and discussion relative to the framing of better laws for the protection of game in the State of Washington. In order to obtain information as a basis to securing practical legislation to improve conditions and prevent the rapid depletion of game animals, birds and fish, Governor Hay appointed two Commissions, one for eastern Washington and one for the western slope, to inquire into the distribution of game animals, birds and fish. These Commissions requested the cooperation of the Forest Service which, through its field men, was in an excellent position to supply valuable data.

A letter was issued calling for a report by October 1, in time to place the information before the Commissions. Supervisor Benedict represented the Service in compiling the data and in meeting with the Commissions and his report shows a remarkable uniformity in the information collected indicating at once that the field officers in general have given much attention to the distribution of game. This feature would also indicate that the reports submitted can with confidence be used as a basis for further work.

The step taken by the State of Washington has aroused interest in Oregon. This was foreseen and the Supervisors of Oregon Forests were also asked to gather information of a similar nature. The information was placed in the hands of Governor West and has been referred by him to the State Game and Fish Commission.

Permanent Improvements

Federal Cooperation

Hearty cooperation has been had both with the Geological Survey and the Bureau of Entomology. Under the supervision of the Geological Survey about 40 regular stream gauging stations have been established where readings are being taken. Under the supervision of the Bureau of Entomology a study has been made of the bark beetle infestation in the Blue Mountains of Eastern Oregon, and active measures have been initiated to control the pest.

The War Department cooperated most thoroughly in furnishing soldiers for the control of forest fires on three Forests.

State and Private Cooperation

Other Investigations

Silvicultural Studies

(See "Other Studies")

Studies of Forest Products

Office of Products

Introduction

The work of the Office of Products during this year has increased greatly over that of the previous year. It is significant that this office is serving as a medium of distribution of general information along all of the lines of work which it represents. The demands for such information on the part of the public have been increased many fold during this fiscal year.

Laboratory Report

Timber Tests

The timber testing laboratory operated in cooperation with the University of Washington at Seattle, Washington, has been testing timber continuously during the year.

Western Hemlock

An elaborate series of strength tests on Western hemlock was completed at this laboratory late in the year. These tests have extended over a period of three years and are now being analyzed and incorporated in final form in a publication on the properties and uses of this wood. The data obtained from the strength tests will serve to establish Western hemlock as an excellent structural wood.

Western Larch

A complete series of strength tests on green and air-dried Western larch is under way at this laboratory. Practically all of the tests have been completed with the exception of a few tests on air-dried material. The data of completed tests has been analyzed and placed in final form and a publication covering the properties and uses of this wood is in course of preparation.

Treated Douglas Fir

Tests to determine the effect of a commercial creosoting process on the strength of Douglas fir in bridge stringer sizes have been practically completed at this laboratory. There remain to be tested a few air-seasoning treated and untreated stringers. In the meantime, however, sufficient data has been obtained on treated timber tested green and air-seasoned treated timber to indicate the deteriorating effect of the commercial process involved in the treatment of this wood.

Fire-Killed Douglas Fir

All of the tests involved in a study of the comparative strength of green logged and fire-killed Douglas fir were completed early in the year. A project report was prepared and the data was given publicity through reports to cooperators. This was an important series of tests and was accomplished with dispatch and satisfaction.

Impact Machine

A large impact machine designed by the Forest Service and constructed and erected by the University of Washington, was put in operation at this laboratory late in the year. This machine is unique in design and operation and is the only machine of its kind known for testing large size wood specimens under impact.

Wood Preservation

National Forests

A set of instructions for increasing the durability of improvement timbers used on National Forests was prepared in this office. These instructions were forwarded to all Supervisors along with a blank to be filled out covering each improvement project on the National Forests. These blanks, when received, will be used in determining what steps

shall be taken to improve the durability of the timbers used. No definite projects have developed as a result of these instructions. However, they have succeeded in stimulating an interest in wood preservation among the Supervisors and other wood users in the district.

Cooperation

The Forest Service in cooperating with the University of Washington, has erected an open tank treating plant on the campus of the University. This plant was operated during the year in the preliminary investigation of problems involving the treatment of poles, paving blocks and cross ties. As a result of these preliminary experiments a working plan for the experimental treatment of paving blocks has been prepared and was put in effect late in the year.

From designs submitted through this office the Oregon Agricultural College at Corvallis, Oregon, and the Washington State College at Pullman, Washington, have constructed and installed open tank post treating plants for treating farm timbers used at these institutions and for demonstrating the application of the open tank process among farmers and students of the two colleges.

Wood Distillation

During the past year members of the office have visited each of the commercial wood distillation plants now operating in the Northwest, and by correspondence the office has kept in close touch with these institutions. By reason of this association we have been able to disseminate considerable information on the subject of wood distillation as to applied to species occurring within the district.

Pulp and Paper

General data and information on the pulp and paper industry have been collected and close touch has been kept with the operations of the pulp mills located in Oregon and Washington. The office has been able to advise numerous prospective pulp manufacturers of locations suitable for the establishment of pulp mills by reason of their location and the proximity of a supply of suitable raw material. During the year one new pulp mill has been established in the district. This now being erected near Spokane, Washington.

Test Tracks

During the year a second inspection of the test tracks laid by the Northern Pacific Railroad Company in cooperation with the Forest Service in 1906 and 1907, was accomplished. The inspections were made in cooperation with District 1 and the Division Engineers of the above named company. An inspection report was prepared covering two seasons of observation.

Kiln Drying

A working plan for studying the commercial processes used in kiln-drying Douglas fir and other Northwest woods was prepared. This plan was put into execution late in the year. As a result of this study the office expects to determine the best methods of kiln-drying local woods and to promote the adoption of these methods in substitution of the present unsatisfactory methods of many mill operators.

Utilization Report

Wood-Using Industries

During the year a complete statistical study of the secondary wood-using industries of the states of Oregon and Washington was inaugurated and carried to completion. Reports covering the industries of both of these states have been prepared. The report for the state of Oregon was printed and distributed by cooperative agreement with the Oregon Conservation Association. Two thousand copies of this publication were given circulation. The report for the state of Washington will shortly be issued either as a Forest Service publication or in cooperation with some responsible state organization.

Fire-Killed Timber

A second season of investigation of the rate of deterioration and usability of fire-killed timber resulted in the compilation of very satisfactory data covering the species found west of the Cascade Mountains in the states of Oregon and Washington. A popular paper covering the data already obtained and including the timber test data obtained at the Seattle laboratory, was mimeographed and two hundred copies were distributed among timberland owners and loggers in the area embraced in the study. This is a continuous study and it is intended to take observations of burned areas from year to year until authentic data is available regarding the rate of deterioration of the burned timber of all species occurring within the district.

Market Studies

During the year two distinct market studies have been completed. One of these covered an investigation of the timber stands, logging and milling operations and secondary utilization of forest products on the Olympic Peninsula in the State of Washington. The other involved a like study in the territory in Eastern Washington and Northern Idaho commonly known as the Inland Empire. Complete data on every logging and milling operation within these two areas was obtained and detailed office reports on each have been prepared and submitted to Supervisors for their guidance and information. These studies have made available to the office a class of information which is serving a very popular public use and have served to show the Supervisors the extent of the local manufacture and consumption of lumber, and indicate to them the

prospective demands for National Forest stumpage by operators now logging private land.

Freight Rates

A paper on the railroad and cargo rates on lumber and other forest products from the Pacific Northwest to the large inland and water markets, was compiled and distributed among Supervisors. The information contained in this paper will serve to show the range and cost of distribution of forest products manufactured from species within the district, and the control of the distribution of local species by shipping rates.

Shingle Mills

A study of the shingle mills of the state of Washington was inaugurated late in the year. This state now produced about 65% of all the shingles manufactured in the United States, and the study will embrace an investigation of the source and form of raw material, its conversion into shingles and the conditions governing their distribution. In connection with this study it is intended to obtain general information on the manufacture of cedar products, all of the data later being combined with silvical data to form a publication on Western red cedar.

Miscellaneous Report

During the year the office has acted as a medium in the collection of the various logs and flitches for experimental use at the Madison laboratory. It has also selected several species for conversion into hand samples for distribution by the Forester. In addition, samples of local species have been forwarded to eastern pencil and shuttle manufacturers for determining their suitability for these uses.

Miscellaneous

Work for Ensuing Year

Lands

During the coming year it is planned to definitely cruise and map a few townships of land in the district, obtaining all the data needed for timber sale management, and for the classification of the land under the Act of June 11, 1906, both the land in its present state and with the timber removed. As much data will be obtained as possible for the office of grazing in connection with this work. This work will be pursued on the Oregon, Colville and Okanogan Forests.

Arrangements have been made to employ an expert in soils and agricultural values familiar with local conditions, to examine and report on lands of doubtful value for agriculture that a final determination may be made concerning the retaining of bodies of

land in central Oregon within the National Forests, and definite conclusions reached on the listability of lands under Act of June 11, 1906, in doubtful cases.

Operation

It is planned to continue a technical study of the forest protection against fire and to devise thorough instructions on improved means of fire fighting. It is planned to have all National Forest areas classified as to their degree of inflammability. Telephone lines and other means of rapid communication, as well as transportation, will be constructed as rapidly as possible. Definite systems of Forest organization for fire protection will be worked out so far as possible.

It is desired to perfect a means of more completely utilizing the services of Forest officers on duty during the winter months. A large percent of National Forest area is under snow for a few months. Plans are being made to assemble Forest officers on certain National Forest areas where work can be effectively done during the winter on permanent improvement work and artificial reforestation.

Silviculture

The reconnaissance of the National Forests has progressed so far, and there is so much demand for timber from the National Forests that it is imperative that more data regarding the growth and yield of our important species be obtained, in order that we may have a basis from which to estimate what the sustained annual yield will be. Intelligent working plans for certain parts of the National Forests can then be prepared. Attention during the coming season, therefore, is to be directed toward getting yield and growth data for the two most important species of the District, – Douglas fir and western yellow pine, which data will be directly applicable in conservatively handling the timber resources of the most important forest types of the National Forests in this District.

In the summer of 1909 a study of the growth and yield of Douglas fir on the better quality of soils in the western foothills of the Cascade Mountains was made, and the results of this study are to be issued in Circular 175. In this study, all necessary volume tables were made so that during the coming season attention will be concentrated upon the collection of yield data, by the measurement of a great number of sample plots in all kinds of situations and soils, and in various aged stands on the National Forests of western Oregon and Washington. Normal stands representing every type of locality in the Douglas fir region will be selected, so that after the data is compiled we will have definite information as to the productive capacity of all sites within the National Forests on the western slopes of the Cascade Mountains.

The second major silvical study to be conducted this coming field season is a continuation of the study of western yellow pine in Oregon which was begun last summer. Sufficient volume table data had already been secured, so that the work this coming season will be concentrated upon the collection of growth measurements from which yields can be predicted. Especial emphasis will be laid upon getting the data in

localities in which selection cutting has already been done, and to get it in such a way that the figures will be applicable in determining the growth and future yield of stands which are now being cut over by the selection system. In the course of the study every effort will be made to get data bearing on the silvicultural aspects of yellow pine selection cuttings, such as the effect of the density of the stand on growth, on the frequency of windfalls, on the recovery of suppressed trees after selection cuttings, etc. The results of these two years study of yellow pine in Oregon should give us, in conjunction with the extensive reconnaissance now being made of the National Forests of the region, a close estimate of the amount of the sustained annual yield of the yellow pine type (**the** commercial type of the forests east of the Cascades), and definite conclusions as to the methods of silviculturally handling this type of forest to get the best results.

Not until the study of these two principal species has been carried to a thorough conclusion is it proposed to undertake, except in a general way, the study of the various secondary species. There is less haste about studying in detail such species as noble fir, amabilis fir, white pine, larch, for these species are either incidental to the major species, Douglas fir and yellow pine, or they are in localities in which no cutting is in progress and, therefore, where they cannot be put under a silvicultural management for several years.

During the past winter one study was made of Western red cedar, a very important secondary species in Washington. One of the chief objects of this study was the collecting of figures for volume tables which would be useful in measuring and estimating logs and cords of shingle bolts of this wood. Valuable silvical and growth data were also obtained, which will show what length of time is required to grow cedar poles and posts, and what methods of forest management will be the most successful in producing succeeding crops of cedar. This report on this subject will be worked up during the coming fall.

One of the most interesting lines of silvicultural work now in progress in this District is the attempt, in cooperation with the Bureau of Entomology, to suppress the infestation of bark beetles in the Blue Mountains of Eastern Oregon. Since 1906, when they were first discovered, the areas of seriously insect-infested timber on the Whitman and Wallowa National Forests have been growing in size, but until the last year or two the bark beetles have been largely in lodgepole pine. During the last year they have been spreading into the much more valuable yellow pine forests and killing a great deal of timber. Last fall experiments in falling and barking infested trees, as a means of lessening the number of the insects, were begun, and these experiments have been continued on a very much larger scale this spring. It is still too soon to judge whether these methods are helpful or not. It is possible that the infestation may die out of its own accord, as similar infestations have done in other localities.

During the last field season much interesting data was obtained relative to the actual amount of damage done by surface fires to merchantable timber. The information secured shows that even the lightest fires do a decided amount of harm, which is

usually not conspicuous, but very real, and that the damage done by repeated light fires is, in the aggregate, enormous. In the average yellow pine forest of eastern Oregon which has been subjected to repeated light surface fires, 45% of the trees over 12" in diameter are fire scarred, and the ordinary surface fire, no matter how light it may be kills from 2% to 5% of the yellow pine trees, particularly those which have been previously fire scarred.

This coming field season it is proposed to start to gather more information as to the damage from surface fires, by having a few local technical forest officers lay off plots in representative fresh burns, which they can watch through a series of years and report on the immediate effects and the after effects of the fire. This actual detailed observation of an experimental plot should yield interesting results.

While no central experiment station has been established in this District, experiments of several kinds are now under observation in a number of localities, and it is proposed to establish more rapidly as the problems of management arises and areas for conducting them, where all the factors favorable to a clear demonstration, are found.

Aside from these experiments, the problems of particular importance which it is hoped may be solved by experimentation on sample plots, are the following. (The first four have already been initiated):

1. Brush burning vs. brush scattering in yellow pine forests.
2. The effect of the density of selection cuttings in yellow pine forests on the subsequent development of the stand.
3. The rate of growth of young Douglas fir stands of various densities.
4. The natural reproduction of Douglas fir forests by the method of single seed trees,
5. The behavior of second-growth stands of Douglas fir after a thinning.
6. The effect of sheep grazing on yellow pine reproduction, both on the germination of the seed and on the seedlings.

With the increase in the number of technical men on the National Forests, and their increased experience, it is hoped that much more investigative work may be done by the Forest Assistants on the National Forests, and that many of the local problems may be studied and solved by them. The chief medium of securing this is the Annual Silvical Report of Forest Assistants. Subjects for these reports are to be assigned by this office, after correspondence with the Forest officers; a thorough study and treatment of the assigned subject is expected. The reports will be of the nature of a monograph on some special vital topic of local interest, the study and discussion of which is going to lead toward the practice of better forestry on the National Forests. Among the subjects to be assigned for next year's report are the following:

1. The relation between the forest and the sage brush desert, with particular reference to the extension of the present limits of the forest by artificial afforestation, in the region of the Fremont National Forest.

2. A study of soil moisture in relation to the forest in the Walker Basis of the Deschutes National Forest, with particular reference to the amount of soil moisture in the forest, and without and with various types of surface cover.
3. Amabilis fir, its quantity, characteristics, adaptability for commercial use, and management of the Wenatchee National Forest.
4. The relation of sheep grazing to yellow pine seedlings.
5. Fall vs. spring broadcast burning of brush after logging in the Douglas fir region.

For the coming year our most important work in artificial reforestation will be the collection of seed. Two dry houses will be built, one near Portland and the other at Puget Sound, and the regions surrounding these localities will be canvassed thoroughly for cones. Prospects are good for an abundant crop of Douglas fir seed in particular this year, and it is our plan to obtain 23,000 lbs., of seed of all species if possible. The next important part of the work will be the planting – out of a million or so of trees which will be ready for planting next fall and spring. Following this, as large an area should be seeded as funds will allow.

Grazing

Every effort will be made to effect increased range improvements both in methods of handling stock on the range and in increasing the use of the range by improving water facilities. Stockmen will be encouraged in this work in an educational way. The unused ranges of Northeastern Washington will be studied and mapped that definite allotments may be made as soon as the sheepmen apply for range. The work of seeking water in the Paulina Mountains of central Oregon will be continued in the hope of bringing into beneficial use a range at present unused.

Outline of Work, Office of Products

Fiscal Year 1912

Introduction

The work of the Office of Products during the fiscal year 1912 will be larger in scope and more varied in character than that undertaken during any previous year since its establishment, and will include practically all line of endeavor represented by the Branch of Products.

Laboratory Report

Timber Tests

The Timber Testing Laboratory at Seattle will be in continuous operation during the year, engaged on various timber test projects, and in addition will carry on the operation of the open tank treating plant erected by the University of Washington.

Western Hemlock

The compilation of data obtained from the series of strength tests compiled in the fiscal year 1911 will be finished and a complete publication on the properties and uses of Western hemlock will undoubtedly be issued before the expiration of the year.

Western Larch

The remaining tests on air-dried Western larch will be completed in the fall of 1911. This will finish the entire project of tests on this species and the results will be summarized and a publication covering the properties and uses of this species will be compiled and issued before the close of the fiscal year 1912.

Treated Douglas Fir

The tests on treated Douglas fir will be brought to a conclusion early in the calendar year 1912. They will then be assigned and combined with tests on treated timber made at other laboratories and will result in a publication on the effect of commercial creosoting processes on the strength of various species, which will be compiled at the Madison Laboratory.

Western Yellow Pine

A complete series of tests on Western yellow pine in the form of floor joist and car sills, both green and air-dried, will be inaugurated early in the fiscal year. All of the green tests will be accomplished before the close of the year. These will be analyzed and ready for use in the contemplated publication on the structural timbers of the United States.

The air drying specimens of this species will be stored and measured from time to time during the year, and observed for shrinkage and loss in weight. Later these will be tested to be included in the publication of the Forest Service.

General Tests

General tests on all the commercial species of timber found in the District will be undertaken at the Seattle Laboratory during the fiscal year. These tests will involve the collection of representative trees of each species throughout the range of the species, the conversion of these tree sections into test specimens and uniform tests on all species, affording direct comparative data. The activities of the laboratory along other lines will probably prohibit complete tests on more than two species during the year.

Impact Machine

The impact machine of the Seattle Laboratory put in operation in the fiscal year 1911, will be operated continuously for determining the relationship between impact and static loading on timber and solving some of the fundamental problems of impact loading previously impossible for lack of a machine of this type. Considerable experimenting in establishing the theory of impact loading will also be accomplished with the use of this machine.

Wood Preservation

National Forests

The office during the year will act in a consulting capacity with the various National Forests in introducing the preservative treatment of improvement timbers on National Forests. Present prospects indicate that several treating plants may be established on distinct Forests during the year.

Cooperation

University of Washington. The office will continue its cooperation with the University of Washington in the operation of the open tank treating plant now erected there. Experiments on the open tank treatment of Douglas fir paving blocks will be under way during the forepart of the year. Later, preliminary investigations of the adaptability of this process to the treatment of Douglas fir and hemlock ties will be taken up. It is expected before the year expires to conduct some experiments on the treatment of posts and trellis poles.

Oregon Agricultural College. The Oregon Agricultural College has constructed a post treating plant from designs submitted by the Forest Service. This office will probably operate the plant for demonstration purposes at times during the year. It will continuously act in a consulting capacity for directing the endeavors of the college in its instruction work and in the treatment of farm timbers used by the college.

Washington State College. The Washington State College has constructed a post treating plant from designs submitted by the Forest Service. This office will probably operate the plant for demonstration purposes at times during the year. It will continuously act in a consulting capacity for directing the endeavors of the college in its instruction work and in the treatment of farm timbers used by the college.

General

The past season's publicity of the economy of wood preservation has brought forth considerable dissemination of information on the subject of wood preservation. During the coming year it is anticipated greater demands will be made upon the office for information along this line. Several commercial concerns are considering the establishment of wood preserving plants, and past established plants are constantly

modifying their treatments and promoting the use of treated timber. This office will continue to keep in touch with present plants and assist in the encouragement of the establishment of new plants.

Wood Distillation

During the year it is anticipated that considerable progress will be made in the methods and processes of distillation as applied to Douglas fir wood. This will be brought about through the cooperative operation of the wood distillation laboratory of the University of Washington. In connection with this work the office will collect material for distillation tests and distillates from commercial concerns for determining their practical application and value.

Test Tracks

Late in the fiscal year the fourth annual inspection of the test tracks laid by the Northern Pacific Railway in cooperation with the Forest Service at Plains, Montana, and Maywood, Washington, will be made. Since these tracks were laid in the years 1906 and 1907, it is anticipated that this inspection will show fairly well the relative durability of the various species and processes used in treating them; also the efficiency of the different forms of rail fastenings used.

Kiln Drying

Early in the year the office will inaugurate a study of the commercial methods now used for kiln drying Douglas fir and other Northwest species. This study will embrace personal observations of the operations of the more efficient kilns now used, and will undoubtedly result in modifications of present processes which will increase the efficiency of the kilns and be conducive to a better economy and success in the manufacture of finish lumber.

Milling Methods

The methods of milling lumber in this District will be investigated with a view to determining the most modern form of equipment and its satisfaction and efficiency in the manufacture of lumber. It is probable that this study will develop a closer utilization by reason of improved methods of manufacture and economy in operation by the substitution of electric drive mill equipment and other means of closer utilization of power.

Utilization Report

While the work of the office was confined very largely to the collection and compilation of general statistical and utilization data during the fiscal year 1911, such endeavors during the next fiscal year will be in the minimum.

Fire-Killed Timber

During the open season of the year a continuation of the study of the deterioration and usability of fire-killed timber will be actively under way. The result of this year's work in combination with that previously accomplished will probably afford information sufficient for present use.

The field studies on burned areas privately owned will be augmented by the establishment of investigative areas on various National Forests, where annual inspections will be made of the burned timbers on the areas, with a view to determining at first hand when the deterioration attacks fire-killed timber, its nature and development. These studies on distinct areas will be conducted directly by one of the permanent officers on each of the selected Forests. They will continue indefinitely or until the data obtained is final and conclusive.

Market Studies

Market studies will be continued as heretofore. The first of these will be confined to the area of Washington bordering on the west shore of Puget Sound. This work will be accomplished during the winter months and will include statistical data on the timber stand, milling and logging operations, secondary utilization and the distribution of forest products from the region studied. Special market studies may be taken up as the occasion demands.

Utilization of Inferior Studies

A special effort will be made in connection with all field investigations of this office to obtain the best authentic data on the utilization of inferior woods throughout the District. Many National Forest timber sales are now encumbered because of the large amount of so-called inferior species, such as white fir, grand fir, lodgepole pine, etc. The determination of present and possible uses of these species will aid materially in promoting the sales of timber from areas on which such species occur.

Shingle Industry

The shingle industry in the state of Washington represents approximately 65% of the shingle output of the United States. These are all manufactured from Western red cedar, for which purpose most of the other cedar logged in the state of Washington is used. In addition, many other cedar products are manufactured by mills of that state. The office will conduct a complete study of the manufacture, utilization and distribution of cedar products in the State of Washington, with a view to augmenting silvical data already obtained for the purpose of compiling a publication on western red cedar.