ANNUAL REPORT TO THE FORESTER, SECTION OF SILVICS - DISTRICT VI

MARCH 1, 1911

Douglas Fir Study –

Since the last report of this Section was written, the tabulation of the date collected in the study of Douglas fir on the western foothills of the Cascade Mountains in Oregon and Washington has been completed, and two reports on this subject prepared. One is a report of sixty-five pages which discusses fully all the information collected in this study, and the second is a more popularly written and much briefer discussion of the same subject. The latter is to be issued as Circular No. 175, and is now in press.

Yellow Pine Study –

The major study undertaken in this District during the past field season is the study of western yellow pine in Oregon, particularly of its growth and yield, and of the characteristics which have a bearing on the silvicultural management of the tree. Two crews of three men each devoted about three months to this study, one crew working entirely in the Blue Mountains of Oregon and the other entirely in Klamath County. 2,482 trees were measured, of about two-thirds of which stump analyses were made; of the remainder only volume measurements were made. In addition, 461½ acres were calipered in order to get data in regard to the normal stand of the tree in this type. Work on the tabulation of this data has been in progress almost uninterruptedly for the past four months, but it is not yet completed. Part of the data, particularly the volume tables, has already been found very useful. One of the most striking lessons from this study is the extreme slowness of the growth of yellow pine in Oregon, particularly in the Blue Mountains. It indicates the necessity of cautious cutting in order to conserve a perpetual supply. The use of the growth and yield data in conjunction with the timber reconnaissance now in progress should make it possible to determine what the annual growth for the yellow pine type (<u>the</u> commercial type of the eastern Oregon Forests) is, and what the annual cut should be. This data will be particularly applicable on the Whitman and on the eastern side of Crater National Forest. Some data was also obtained in regard to the soil moisture requirements of yellow pine, and its reproductive characteristics.

It was at first intended to prepare a report for publication as a circular, based on the work of this one season and called "Western Yellow Pine in Oregon." Owing to the great variety of conditions in various parts of eastern Oregon, in only a few of which the study was conducted last summer, it is thought better to continue this study along similar lines this coming summer in order that the published circular may be based on enough information to be reliable and convincing, and be broad enough in its scope to include all parts of the yellow pine region of Oregon.

The total cost of the field work in connection with this study amounted to approximately $1,850 exclusive of Mr. Munger's time in the field on this study, which amounted to about five weeks. From this amount should be subtracted $125 in consideration of the fact that about a week was spent by each yellow pine crew in fire fighting.

Sand Dune Study –

A brief study was made in April 1910 of the sand dune region of the Siuslaw National Forest. The encroachment of the sand dunes, many of which lie within the National Forest, upon valuable agricultural land, forest land and harbors, is a local problem of considerable economic importance. The field study of this problem suggests the practical wisdom of retaining within the National Forest this sand dune region in order that when the time comes for extensive control measures, they may be undertaken under Government supervision, as they could not be were the land in private ownership. In order that the drifting of the sand may be no further augmented, the report prepared at the conclusion of this study recommends the absolute exclusion of all grazing and the most efficient fire protection on the dunes.

Experiments were undertaken to test the adaptability of various species of exotic trees to this sand dune region, but owing to the lateness of sowing, the severity of the summer drought and to the exposed situation of the experimental area, the sowing has resulted in nothing. The experiments will be continued under more favorable conditions this spring with maritime pine seed, and with several hundred cuttings of various species of poplar and willow.

Study of Avalanches –

In May and in August a brief field study was made of the avalanches of the Cascades in Washington, with a view to determining what relation exists between forest denudation and the formation of avalanches, and what practical measures are possible to decrease this occurrence. The conclusion reached was that a certain kind of avalanche, i.e., slopeslides, such as the destructive one at Wellington, are possible only when the forest cover has been destroyed. Efficient fire protection and the reforestation of the denuded slopes which will not restock naturally, will tend to decrease the occurrence of avalanches. The report which was prepared as a result of this study is now being revised with a view to publishing it as a circular entitled "Avalanches of the Northern Cascades."

Permanent Sample Plots –

On the Umpqua National Forest, in an excellent pure stand of Douglas fir, fifty-four years old, three permanent sample plots of one acre each were established, all the trees numbered and tagged, and their diameters accurately measured. These plots were established with a view to determining the rate of growth of these trees through the term of years. Since the density of the timber on the three plots is somewhat

different, though all other conditions are clearly similar, a comparison of the plots a few years hence will serve to illustrate the effects of density on growth. At a later time a thinning may be possible on one or two of these plots, and thereby a comparison made of the growth on thinned and unthinned plots.

Intensive Study of Cut-Over Area –

A cut-over area in the Douglas fir timber of the Wind River Valley on which single seed trees were left after logging and broadcast burning, was selected for intensive study. An area of seventy-five acres was established in June, all the seed trees upon it measured, tagged, and platted on a map, and a series of 110 square-rod reproduction plots laid off and permanently marked. The seedlings on all these plots were then counted and tallied by age and species. They were recounted five months later after the close of the vegetation season; it is the plan to again recount them every six months or a year for three or four years.

It is expected that the repeated examination of this area will lead to definite conclusions in regard to the success of this method of Douglas fir management, the distance to which seed is disseminated from seed trees, the relation of brush and weeds to the growing of seedlings, the factors which are particularly favorable or unfavorable to the germination of Douglas fir seed and the development of the seedlings.

Brush Disposal Experiments –

In addition to the two experiments areas already established on which the two methods of brush disposal in the yellow pine type, piling and burning and scattering and not burning, are being tried, a nine-acre plot has been laid off on the Deschutes National Forest. Here the soil is an extremely dry pumice, yellow pine reproduction is rather poor, and therefore the conditions are particularly favorable for a conclusive experiment.

Study of Damage Done by Surface Fires –

Owing largely to the repeated appearance of statements saying that frequently recurring light surface fires do no harm to the forest, but that they consume the combustible material and make impossible the occurrence of severe fires, a study was made of the damage actually done by typical surface fires in several localities in both eastern and western Oregon. Strips were run across the burns and all the trees scrutinized and thrown into classes according to the damage which had been done to them by the surface fires. Burns on six Forests were so studied, partly by Mr. Munger and partly by the local Forest Assistants. The data has been tabulated and it shows most strikingly the large number of trees which are either burned off by the surface fires or are fire-scarred. The serious effect of such fires is particularly apparent in yellow pine stands.

Insect Infestation Investigation –

One of the most important lines of work which has been conducted by this Section is the reconnaissance of the bark beetle infestation in the Blue Mountains of Eastern Oregon. The infestation, which has been present and rapidly spreading in the lodgepole type of the high mountains for several years, appeared abundantly in the yellow pine of the Whitman National Forest in the spring of 1910. A rough reconnaissance of the Forests of the Blue Mountains was undertaken in order to find out the areas infested, the rapidity and direction of spread of the invasion, and the practicability of control measures. The Whitman, Wallowa, Malheur, Deschutes and Wenaha National Forests were so reconnoitered, but widespread, serious conditions were found only on the first two of these.

In the fall of 1910 active control measures were started on the Whitman Forest in the yellow pine type. The infested trees on 340 acres were cut and burned, and 1,000 acres of adjacent forest was minutely examined and declared to be free of bark beetle work. The control operation will be continued on an even larger scale this spring on the Whitman National Forest, and probably started on the Wallowa National Forest.

Western Red Cedar Study –

In January a crew of three, Forest Assistant Jackson and two Rangers, went into the field to make a study of western red cedar, in particular to gather data for volume tables, growth tables and silvical notes. This work will be confined entirely to the commercial zone of red cedar on the western foothills of the Cascades in Washington. This crew will probably remain in the field three months, at the end of which time, if the data is found to be sufficient in conjunction with the already available, a report will be prepared, for publication as a Forest Service Circular, descriptive of this tree, its range and abundance in the Northwest, its rate of growth, commercial use, and adaptability to management for the forests of the future.

Experimental Sowing and Planting –

In the division of work in this office the conduct of experimental sowing and planting, as well as of extensive artificial reforestation, has been handled by the Section of Planting, but on several occasions work of this nature has been done by Mr. Munger, principally on the Wallowa National Forest where some of the old experimental areas were looked over, new areas selected, and plans for the experiments made, and on the Wenatchee National Forest where the sowing operations were supervised.

Herbarium –

During the year considerable dendrological data concerning the trees of the District, and some rather notable additions to the hitherto reported ranges of several trees have been obtained. Several new specimens have been added to the herbarium of this office.

Library –

The library has grown decidedly both in number of books and in the use which is being made of it. It now occupies sixty-four feet of shelf, and the card catalogue consists of approximately 5,300 cards. Its increased usefulness is largely due to the fact that, during the last five months, Mrs. Miller has had her desk in the library and devoted considerable time to the library work, and in this way gained a familiarity with the books and catalogue which makes them more readily accessible to those in search of information which the library contains than they were before.

Computing Clerk –

A large part of the year, the computing clerk has devoted her time to the tabulation of Douglas fir and yellow pine data, and during a short time she was assisted by a temporary employee. While not engaged in work in connection with these studies, her time has been filled with computing of timber sale reports, products, and other routine data.

Lectures at Ranger School –

A course of sixteen lectures was delivered at the Short Course of Forestry at the University of Washington by Mr. Munger in February, on the subject of Silvics, Reconnaissance, and Planting on the National Forests. These subjects have not been taken up fully at this course in previous years, yet it is essential that the rangers should know about these important phases of National Forest administration.

Supervisors' Meeting –

At the Supervisors' Meeting in March, 1910, Mr. Munger read a paper on "Silvical Problems of the Northwest."

Tax Study –

While not, perhaps, logically classed as a silvical study, the study of the taxation of forest lands in Washington which is now being conducted, is administered as a project of the Section of Silvics. This study is being conducted by Professor F.G. Miller and Mr. F.B. Kellogg, the former having been in the field during the summer and the latter during the past three months, gathering data in all the important forested counties of Washington, which will lead to the preparation of an exhaustive report on this subject. Field work will be continued by Mr. Kellogg for two months more. A circular outline of inquiry regarding the taxation of timber lands has been mailed to over a thousand owners of timberland. In addition, over one hundred men interested in timberlands, county tax officials, legislators, etc., have been personally interviewed.

Clover Fire Line Experiment –

On the Colville National Forest an experiment has been initiated by the local officers to test the practicability of making fire lines by sowing strips of clover, which in that country

remains green in the summer, and which it is thought may serve to stop a surface fire. A strip 75 feet wide and over one and a half miles long was sown with 116 lbs. of clover seed this fall, and the growth of the clover will be closely watched and its efficiency in stopping light fires tested.

Annual Silvical Reports –

Annual silvical reports have been received from most of the Forests of the District this year, since with but one or two exceptions every Forest now has a Forest Assistant. For those Forests for which a silvical report had not previously been prepared, this first report was of a general nature descriptive of the forest types and trees. For the remaining Forests, the reports dealt with some specific topic, which was assigned by this office, after receiving suggestions of possible subjects from the local officers. Many of these reports are excellent, showing live interest in and close observation and thought concerning the local problems. Others of the reports are very disappointing in that they reveal a failure to appreciate the technical problems, and a failure to see thoroughly and accurately forest conditions as they are.

There is also, I am glad to say, but on a very few Forests, a tendency in both Supervisor and Forest Assistant to regard the Annual Silvical Report as a very difficult and unnecessary task, imposed as a matter of routine by the District office. This attitude is being overcome; but, needless to say, where the attitude is shown, there is a tendency for the technical standard to be lowered.

It is planned this next year to still more intensify the importance of the annual silvical report, to require one from each Forest Assistant, even where there is more than one on a Forest. Subjects will be allotted by this office, with full instructions in some cases as to how to conduct the study, and a thorough treatment of the subject will be expected. It is intended to make the scope of these subjects as broad as possible, in order that there may be full play for individual ability, and preference in the choice of topics. In order to make this report cover a wide range of subjects, it is suggested that since the quarterly technical reports have been made non-compulsory, the name of the annual silvical report be changed to annual technical report.

Without a regular compulsory report of this character, there would be a tendency for the technical ideal of the Forest Assistant and other officers on a Forest to lapse into apathy toward investigative work, experimentation and improvement in technical methods, which would be very regrettable. This report should serve to arouse interest in the one who makes it, and indirectly in those about him, in some one problem, it will sharpen his power of observation and develop a habit of studying forest conditions which cannot help but make him a more useful Forest officer. The reactionary influence of the silvical report on those who make them is not by any means the chief value of these reports. They each year add materially to our store of knowledge in silvical matters, assist us to better understanding of the problems of forest management, and thereby promote better forestry on the National Forests. They are, moreover, the only regular outlet for the information and observation on forest conditions which the Forest Assistant has been

collecting during the year, which without this channel might go unrecorded. Following is a list of the titles and authors of the annual silvical reports received this year:

Cascade	"The Natural Reforestation of Burns on the East Slope of the Cascade National Forest," by E.B. Starr
Crater	"Commercial Trees of the Upper Slope Type," by H.D. Foster
Deschutes	First General Descriptive Report, by R.R. Chaffee
Fremont	First General Descriptive Report, by N.G. Jacobson
Malheur	First General Descriptive Report, by H.J. Miles
Oregon	"A Study of the Effect of Ground Fires on Mature Stands of the Lower Slope Type," by W.B. Osborne
Siskiyou	"Chaparral Areas of the Siskiyou National Forest," by H.E. Haefner
Siuslaw	First General Descriptive Report, by R.E. Dickson
Umatilla	"Western Yellow Pine Reproduction," by G.A. Bright
Umpqua	"Burns Along the Middle Fork of the Willamette River," (not yet received)
Whitman	"Lodgepole Pine in the Whitman National Forest," by M.L. Merritt
Chelan	"Lodgepole Pine in its Relation to Yellow Pine," by H.M. Coan
Columbia	"Resources of the Columbia National Forest," by A.R. Wilcox (substituted for silvical report)
Colville	First General Descriptive Report, by E.W. Headsten
Olympic	First General Descriptive Report, by W.H. Gibbons
Snoqualmie	(Excused in lieu of Forest Assistant Jackson being assigned to red cedar study)
Washington	"An Investigation of Burned-Over Areas on the Washington National Forest," by H.M. Johnson
Wenatchee	"Deforested Burn on the Wenatchee National Forest," by C.P. Willis
Chugach	"Cedar on Prince William Sound.," by L. Wernsted
Tongass	"Future Reproduction and Timber Growth of the Forests of Southeastern Alaska," by B.E. Hoffman

Special Reports –

In addition to the reports prepared in connection with the studies mentioned above and the annual silvical reports, there have been a number of special studies made by the local Forest officers which deserve mention: -

"Silvical Advantages of Fall Brush Burning on Clear-Cut Areas of Douglas Fir on the Washington National Forest," by H.M. Johnson

"Silvicultural Aspects of Cutting in Open Yellow Pine Forests, Crater National Forest" (with tables showing increased growth after a selection cutting 22 years ago), by H.D. Foster

"An Effective Biltmore Stick" (showing the result of a comparative test of a Biltmore stick and a pair of calipers in measuring the diameters of trees), by A.G. Jackson

Standardization of Tree Measurements –

An effort has been made to standardize the tree measurements taken in this District, particularly volume table measurements, by furnishing Forest officers who are to take measurements with an outline and instructions. The advantage of doing this is to make it possible to correlate data taken in various places, and to add at a later date to any data, as it would not be possible to do unless a uniform system were adopted.

SUMMARY

Now that the District organization has been in operation nearly two years and a half, the field of the Section of Silvics has been well defined by actual experience, and the lines of work toward which the Section should devote its attention can be seen clearly in their proper prospective.

The work which falls to this Section may be grouped into four classes:

1. Correspondence, not connected with the administration of the National Forests, with the general public in answer to requests for information on technical matters, and the preparation of memoranda and special reports not related to National Forest work.

2. Routine work in connection with the administration of the National Forests. Under this heading is included work which in the division of the District office work falls naturally to the Section of Silvics, - such as the acknowledgment of regular reports like the annual silvical reports, reports on cut-over areas, experimental areas, and the like, and the necessary correspondence therewith; correspondence with Forest officers relative to the collection of dendrological information, the identification of specimens, insect infestation and tree diseases, and the direction of operations in connection with insect control; the supervision of the District Office library, together with the photograph collection and the distribution of publications, and correspondence with the Supervisors relative to their libraries; the handling of matters pertaining to Weather Bureau cooperative stations, phenological observations, etc.

3. The preparation of special reports for use by the District Office, such as articles for publication, lectures, outlines, memoranda on various subjects which naturally come within the province of the Section.

4. Special studies and experiments, initiated with the purpose of collecting data for publication, of obtaining information which will be helpful and instructive in forest management, or of solving some particular forest problem.

It seems logical that the field of this Section should be broadened so as to include beside the collection of data, the application of data to the management of the National Forests; e.g. the Section which gathers data in regard to the growth in a forest type, is naturally in a good position to apply this growth data in deciding upon the sustained annual yield, or, as another illustration, the Section which makes field studies leading to conclusions in regard to methods of marking, is naturally in a good position to advise in regard to methods of silviculture on timber sales. It is a natural tendency of this Section, therefore, to assist in applying to the National Forests the conclusions which the field investigations made by this Section have taught. This close cooperation between the investigative Section, Silvics, and the administrative section, Timber Sales, is advantageous, since it will work toward a direct and sure application of the results of the silvical studies to the practical silvicultural work on the National Forest.

It has been suggested sometimes that the conduct of silvical studies now in charge of the District office, i.e., the major silvical studies of the District, be placed wholly in charge of the local Forest Assistants on the National Forests. Such a procedure, in this District at least, does not seem to be advisable. Studies of local forest problems and experiments may, of course, be successfully carried on by the local force, but the major studies, such as the Douglas fir and yellow pine studies already made, almost demand the direction and supervision of the District office. There are many reasons for favoring the concentration of the responsibility for investigative work in the District office:

1. Many of the studies embrace two or more National Forests and cannot, therefore, properly and economically be conducted by the force of one Forest or by several forces each on their own Forest.

2. The local force of a Forest are primarily administrative officers; it is well that they should do some research work to supplement this administrative work, but it is not to be expected that they would push investigative work with the vigor or conduct silvical studies as easily and efficiently as those whose sole work it is. Should all investigative work be left to the local Forest officers to conduct, it is probable that being incidental to other work, it would receive less attention than where it is in the hands of specially organized crews under the supervision of the District office.

3. Much of the investigative work carried on in the District has no real connection with National Forest work, some of it is for educational or purely scientific purposes, and it is, therefore, not properly chargeable to the National Forests.

4. The District office has the best facilities for working up the data collected in silvical studies, better than are possible in a Supervisor's office - trained computing clerk, adding machine, etc.

5. The efficient handling of important investigative work necessitates that it be conducted by central office, which is in touch with the conditions and needs in all parts of the District, both inside and outside the National Forest, so that plans may be drawn up which are broad in their scope, and so that studies and experiments conducted in various parts of the District may be correlated one with another.

These, therefore, are some of the reasons why it seems wise to continue the present system of District Office direction and supervision of the important investigative and experimental work. But for the District Office to carry on the studies, keep track of the experiments already initiated and handle effectively the regular routine work of this Section, an adequate force is necessary. An increase in the present force, i.e. to have two men instead of one permanently assigned to this Section of the District Office would very materially add to the usefulness of the Section. To have two men in this Section would make it possible to keep the routine – the records of experiments, the library, the dendrological notes – up to a high degree of perfection, it would make advisable the initiation of a larger number of experiments than it is now thought can be kept up in good shape, it would make it possible to keep up a larger correspondence with the general public and thereby stimulate a greater interest in technical forestry in this District than is now possible with the present force which is in the office but a portion of the year.

One of the chief advantages of an increase in the permanent force of this office would be that it would be possible for one person to concentrate on some one study and throw all his thought and energy into that study until it is completed, while the other member of the force attends to the routine work and minor studies. An ideal organization would be such that one man who is particularly qualified could devote his whole time and thought to a study, like that now in progress of western yellow pine in Oregon, and thoroughly master the subject before his results are published or his recommendations and conclusions are circulated. This arrangement would result in reports of a higher scientific value and should make possible the quicker completion of reports. In order to accomplish this result, the temporary detailing for Forest Assistants from a Forest to the Section of Silvics for the study of some particular topic, and the preparation of the report is possible, but is not apt to be as effective as permanent assignment to the District Office.

Even were the force of this Section increased, it is not thought to be advisable to conduct many important studies at a time, but to concentrate on a very few and do those thoroughly. With the present small force, this procedure seems much the wiser course. In the same way in regard to experiments, - they are valueless unless they can be efficiently cared for, watched, and recorded, and, therefore, no more should be initiated than the force, either local or District Office is capable of keeping up.

(Signed) Thornton T. Munger
March 14, 1911