ANNUAL SILVICAL REPORT

MARCH 1, 1919

DISTRICT VI

BY

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Annual Report to the Forester
Section of Silvics – District VI

March 1, 1912

The attention of this Section during the past year has been, to a large extent, directed toward completing and enlarging the projects which were under way when the last report was written, hoping thereby to carry to a conclusion the major studies for which there is the most immediate use.

The general resume of the field of work and the discussion of the policy to be followed, fully discussed in the report of March 1, 1911, are of equal application at this time, and, therefore, need not be repeated or materially supplemented.

The personnel of the Section of Silvics since the last report was written has been as follows:

Mr. Munger
Mr. G.A. Bright, since July 1, (engaged solely on yellow pine study)
Mr. E.J. Hanzlik, since July 1, (engaged solely on Douglas fir study)
Mr. A.G. Jackson, for 3 months, (engaged solely on red cedar study)
Miss Bell, computing clerk
Mrs. Miller, library clerk, (assigned to the Office of Silviculture)
Two temporary computing clerks for two and four months each respectively
Two field assistants for about three months each
Two field assistants for about four months each

Yellow Pine Study –

As was stated in the report of 1911, it was decided that the data obtained in the summer of 1910 on the growth and silvical characteristics of yellow pine in Oregon, was not sufficient to warrant its publication as a monograph. Therefore, field work was continued by a party of three, headed by Forest Assistant Bright, for three months of the summer of 1911. In this time data on the growth of yellow pine was obtained in a good many localities in which previously no study of yellow pine had been made, and stump analyses of over 3000 trees were obtained in addition to considerable other data relative to the silvical requirements of this tree and the factors affecting its growth. The tabulation of this data has been in progress for three months, and is now nearing completion. Mr. Bright will prepare a report, taking up very fully a discussion of the growth and yield of this tree in Oregon, using as a basis the analyses of 5500 trees made in the two seasons of work. It is thought that fully enough information on this project has been obtained to make an authoritative circular or bulletin called "Western Yellow Pine in Oregon," and such a publication is now in process of preparation. It will contain, in addition to a discussion of growth and yield (briefer than that to be compiled

by Mr. Bright), the results of the studies which have been made in the last three years of various topics in connection with the characteristics of yellow pine trees and forests in Oregon.

The cost of this yellow pine study since March 1; 1911, is approximately $1754.00 of which the field work cost $1180.00 and the office work to date, $574.00. About $200.00 additional will be required to complete the tabulation of the data and the report.

Douglas Fir Study –

The study of Douglas fir made in 1909, the results of which are published in Circular 175, was confined to the better classes of soils on the foothills of the Cascades, chiefly outside the National Forest. In order to get data on the poorer qualities of soils and in types most typical of the National Forest, a crew of three, headed by Mr. Hanzlik, spent four months in the field in the summer of 1911. They took measurements in 32 different situations in normal, even-aged stands, representing a great variety of conditions, measuring 308 sample plots. These have all been worked up and combined with the 361 plots taken two years ago, and normal yield tables prepared for three qualities of soil and for ages from 20 to 140 years. This yield table has been completed and a copy sent to you. Mr. Hanzlik has practically completed a report embodying all the data so far obtained on the yield on Douglas fir stands in Western Oregon and Washington, in which he discusses fully all the factors influencing the growth and yield of these stands.

This study forms a very valuable supplement to that made in 1909, and the information resulting from it will find an immediate and wide application, both in arriving at estimates of the potential yield of the National Forests in the Douglas fir region, in determining the value of certain parcels of land for forest purposes, and as furnishing a substantial basis from which the private timber land owner may ascertain what yields may be expected from various kinds of situations. Though this subject is of rather local application, it is hoped that the report may be given a good circulation, either as a circular or in local trade and technical journals.

This year's study has cost $2027.00, of which $1320 was for field work and the balance for office work; the completion of the report will require but a small amount of time.

Red Cedar Study –

Field work in connection with the study of western red cedar in the Puget Sound country, by a party of three, led by Forest Assistant Jackson, was in progress January 15 to April 15, 1911, and data on about 1300 trees was secured besides a good deal of additional data on the cedar industries. The compilation of the data was commenced soon after. The tables, of which there are several, volume tables in cubic feet, in board feet, and in shingle bolt cord, taper tables, and diameter, height and volume growth tables, are completed, and Mr. Jackson is now engaged in the preparation of a report on "Forest Characteristics of Western Red Cedar in Western Washington." It is proposed to publish this report in conjunction with a full report on the "Utilization of

Western Red Cedar" by Mr. Knapp. This joint monograph on this species by the offices of Silviculture and Products, will probably be completed within a few weeks.

The cost of this study has amounted to $1810, of which $1279 is field work and $530 is office work. It is estimated that it will cost about $50 to complete the report, i.e., the Silviculture portion of this joint publication.

Experiments in Sand Dune Control –

In order to test various means of direct reforestation of the sand dunes of the Siuslaw National Forest, experiments were continued in March 1911 in three locations. Altogether there were planted:

2030 Willow Cuttings (several varieties)
100 Lombardy poplar cuttings
99 Trembling aspen cuttings

12.6 acres sown with Maritime pine seed (several methods)
3.22 acres sown with mesquite grass seed

An examination of these experimental plots early in August, 1911, (Report of August 15, 1911, by Mr. Munger, of which you have a copy) shows that the direct seeding resulted in failure, not through the inability of the Maritime pine to germinate, but because of its inability to get a foothold in the shifting sand. The willow and poplar cuttings were doing excellently considering the poor quality of some of the cuttings. Their success warrants trying this method of dune reforestation on a much more extensive scale. Therefore, very similar experiment, particularly in testing various kinds of situations, are being repeated this season, and the field operations are now in progress. About 17,000 willow cuttings made by rangers in various parts of the State, and 3,000 maritime pine transplants are on hand for planting. Should these experiments demonstrate the practicability of any of these means of reforestation, a plan for the extensive reclaiming of these sand wastes should be prepared and put into effect, in order that these areas may not be allowed to lie barren and a menace to surrounding lands.

Fire Damage Study –

In the last report it was mentioned that a field study was made in a number of localities, quite largely by the local Forest Assistants, of the damage which light surface fires do, chiefly with a view to bringing out definite figures to show how real this injury is thereby combating the "light burning theory." The results of this study were quite striking, and they have been given general circulation in mimeographed form among Forest officers and the press.

To supplement this study, by determining how much loss there is in commercial timber on account of fire-scarred butts and "fat pitch" in an average yellow pine forest, the scalers on one of the timber sales on the Whitman National Forest kept a record of the

proportion of the butt logs that were fire-scarred or "pitched," and the amount that the scale had to be reduced because of fire damage. A record was kept of 1184 butt logs and the results shows that 22.8 percent of the butt logs are more or less scarred, and that 18.6 percent of the logs lost in scale by fire damage 46.1 feet apiece, and many more are damaged by being pitchy. A copy of the report on this study has recently been sent to you. The cost of the study of butts logs amounts to practically nothing, since all the field work was done by the scalers in the course of their regular work in moments when otherwise they would not be busy.

Insect Control Operations –

Operations on an extensive scale, with a view to preventing the spread of the infestation of *Dendroctonus monticola* in Eastern Oregon, were undertaken in early April, 1911, in cooperation with the Bureau of Entomology and the local organization of timberland owners, and were continued until June 30. The technical work was directed by Mr. Burke and Mr. Edmonston of the Bureau of Entomology, and the field work was administered by Supervisor Ireland and Ranger (now Deputy Supervisor) Barnes of the Whitman National Forest, who had a crew of 65 to 100 men at work. About 84,000 acres along the east side of the Whitman National Forest, within and adjacent to the boundary line, were looked over and the infested trees on this area treated to kill the bugs, chiefly by felling and peeling. Altogether 26,573 trees were treated, considerably over half of which were lodgepole pines, at a total cost of $23,582.79. It is yet too soon to tell whether these operations have had any beneficial effect in stopping the increase of the infestation, but the area will be carefully gone over this season to judge of the practical value of this kind of work.

Avalanche Study –

At the writing of the last report the revision of the report on "Avalanches of the Northern Cascades" was in progress. It has been completed and the report has now been published as Circular 173, under the title "Avalanches and Forest Cover in the Northern Cascades."

Silvical Examination of Timber on Malheur National Forest –

Three weeks of field work and considerable office time were devoted by Mr. Munger to an examination of and report upon a large area on the Malheur National Forest, a project which was undertaken with the object of ascertaining, among other things, what the general health and silvical condition of the timber was. This information was sought partly in the interests of a company which owns the odd sections in this part of the National Forest, and which will shape their policy of administering their timber according to its degree of decadence and freedom from disease, and partly to assist in deciding upon a policy for handling this body of government timber. The timber was found to be fairly free from damaging agencies, though like most virgin stands of yellow pine, fully mature, but not in immediate need of cutting.

Brush Disposal Experiment –

None of the three experiments on which the two methods of brush disposal in the yellow pine region are being tried side by side, have been in operation long enough to show results, and therefore have not as yet been reexamined closely. Forest Assistant Foster has recently established and described in detail an experimental area of 20 acres on a timber sale on the Crater National Forest, which as yet has not been logged, however, but which should yield interesting results for this particular locality within a few years.

Experiment to Determine Effect of Sheep Grazing on Yellow Pine Reproduction –

It has been desired for some time to demonstrate what effect, if any, sheep grazing has in promoting the germination of yellow pine seed, in order to decide upon a policy in regard to grazing after timber sales and to determine whether grazing may be used as an adjunct in artificial reforestation by sowing. This past season an area on a large clean burn on the Malheur National Forest, suitable for studying this question experimentally was found. Four comparative plots were laid off, and two of these were fenced with barb wire. These plots were treated in the following manner:

Plot 1. Fenced, sown with 5 lbs. yellow pine seed , but not grazed.
Plot 2. Sown with 5 lbs. seed, grazed and then fenced.
Plot 3. Sown with 5 lbs. seed, grazed, and ordinary grazing allowed thereafter.
Plot 4. Check plot, nothing done.

It is thought that if there are any positive results, it may be determined (1) whether or not sheep are beneficial in preparing a seed bed for yellow pine and harrowing in the seed, and (2) whether moderate sheep grazing is detrimental to the reproduction after it starts.

Intensive Study of Cut-over Areas –

The 75-acre permanent plot in the cut-over timber sale area on the Columbia National Forest was given its annual re-examination in early July, and the result of this examination was embodies in a report under date of July 18, 1911, of which you have a copy. There has apparently been little change in the amount of reproduction on this area in the past year; a small percentage of it has died and the competition of the remainder with the herbage is getting acute. It is noteworthy that none of the solitary seed trees have been windthrown or broken off since the last count, so that in the 13 months that the experiment has been in operation but one seed tree on the 75 acres has been felled by wind.

It was hoped that more plots for the intensive study of Douglas fir cut-over areas could be established this year, but so far no suitable areas can be found on the National

Forests, either because the timber sale areas are too small or are not being reforested by reserved seed trees.

Permanent Sample Plots –

In accordance with the plan initiated some time ago, permanent plots on which all the trees are numbered, tagged and accurately measured, are being established as opportunity offers in various types, in order to watch their growth and to study in detail the effect upon them of various conditions of soil, density, etc.

In the past year two permanent plots of ½ acre each, in a 51-year old stand, and two plots (not tagged) in a 38-year old stand, have been established on the Siuslaw National Forest; and a 40-acre plot in the yellow pine forest on the Crater National Forest, on an area in which a selection cutting has recently been made to determine the effect of cutting on windfall, reproduction and increased growth.

Tax Study in Washington –

The study of forest taxation in Washington (which as previously stated is not strictly a Silvics study, but is so classed for convenience) was completed in the early summer, and the report of 204 pages by Prof. F.G. Miller and Mr. F.B. Kellogg, which has recently been submitted, is an exhaustive thorough discussion of this topic. It is hoped that if this report is approved in substance, it may be published, in part at least, in cooperation with some local organization so that this valuable discussion of the tax problem may be brought to the attention of the people of the State.

Herbarium –

Work of a dendrological nature in connection with the herbarium has occupied considerable attention this year. Last spring a key to the coniferous species of the District and a chart showing their occurrence on the Forests, was prepared and distributed among the field officers. This has decidedly increased the interest of some Forest officers in dendrological work. During the last season specimens from approximately 75 trees of the various species of Abies that occur in the District, were sent to this office for identification. This collection and study of the Abies have very materially increased an understanding of the identity and ranges of each of the species.

The range maps furnished by Mr. Sudworth have been revised so as to contain all the data on record in this office as to the distribution of the trees of the District,

The collection now contains about 200 separate mounted dendrological specimens, in addition to a few entomological and pathological specimens. If there were more room available to store and display a large collection, an effort would be made to decidedly enlarge it, particularly the collection of wood specimens.

Library –

The library has become one of the important institutions of the District Office, and is largely used, its use apparently increasing in proportion to the attention that is given to the cataloguing of books, pamphlets and periodical literature, and to obtaining current publications of local interest. The library is cared for by Mrs. Miller, whose familiarity with the books and catalogue largely increases their usefulness. The library now occupies 72 feet of shelf exclusive of periodicals, an increase of 8 feet over last year, most of the increase being in pamphlets, and the card catalogue consists of approximately 7500 cards, an increase of about 2200 in the year.

Computing –

The time of the computing clerk during the past year has been almost wholly occupied on the computing and tabulating in connection with the three major studies of this Section, red cedar volume and growth, Douglas fir yield and yellow pine growth, and for these studies additional computing help has been employed. The minor studies have entailed some computing work, and in addition to the tables in connection with the above mentioned major studies, a volume table for Douglas fir based on the measurement of 397 trees from the Crater National Forest (east side) has been prepared and sent out as "The Pelican Bay Volume Table for Douglas Fir."

Annual Silvical Reports –

The procedure initiated two years ago of having the Forest Assistant on Forests for which a general silvical report has already been prepared, devote subsequent reports to the discussion of some special topic, has been followed again this year. The subjects were assigned by this office from a list of two or three subjects submitted by the Forest. This year only one general report (for the Wallowa Forest) was prepared; all the others deal with special topics of live practical interest, with which the Forest Assistant was particularly familiar or had particular opportunities to study. Some of these reports are exceedingly good and are real contributions to the forestry literature of the District. This system of annual silvical reports works well on the whole, and seems to result in as much data of real value as any system would. When the reports are of slight worth, it seems to be due to either of two causes: (1) Inability of the author to make a scientific study and write a report of value, though he tries his best; and (2) slighting of the report because of lack of interest in it or pressure of other work. The latter cause can be overcome, but the first can not, for it is not to be expected that every Forest Assistant in the District is able to carry on an investigative study and write a report of value. The attempt, however, has a beneficial reactionary effect on the one who makes the report. The present system, however, of requiring a report from all Forest Assistants should be continued by all means, but so far as possible, topics in conformity with the special interests and activity of each Forest Assistant should be assigned. Thereby reports of the maximum utility will be received. Following is a list of this year's Annual Silvical Reports:

Cascade	Methods of handling the decadent stands along the	B.F. Heintzleman

	Willamette River	
Chelan	What do silviculturally with the Alpine type	H.M. Coan
Columbia	Report on topographic work on the Columbia National Forest	L. Wernstedt
Colville	The Western Red Cedar	E.W. Headsten
Crater	Interrelation between brush and tree growth on the Crater National Forest	H.D. Foster
Crater	Rate of deterioration of timber on Cat Hill Fire, Crater Forest	W.W. White
Fremont	The extension of the present limits of the Yellow Pine forest out on the desert	N.G. Jacobson
Oregon	The necessity of combining the United States General Land Survey with the Topographic Control	W.B. Osborne
Rainier	The influence of altitude and exposure on the reforestation of burns on the west slope	E.J. Fenby
Siskiyou	A study of Lawson Cypress on the Siskiyou National Forest	H.E. Haefner
Snoqualmie	Merits and defects in the method of gathering topographic data by means of valuation survey strips as practiced on the Snoqualmie Forest with suggestions as to the improvement of the method	W.H. Leve
Tongass	A study of Sitka Spruce in Alaska and a plan of management to encourage its growth	B.E. Hoffman
Umpqua	Insect damage to Douglas Fir in the vicinity of the Mountain Meadows planting site	B.F. Kerr
Wallowa	General silvical description of forest conditions on the Wallowa and Minam National Forests	R.M. Evans
Washington	Arrangement of seed trees on Douglas Fir cuttings	H.M. Johnson
Wenatchee	Amabilis Fir in the Wenatchee Forest	C.P. Willis
Whitman	Study of Western Larch	H.P. Gilkey

One more report is yet to be received, entitled "Experiments in Nursery Practice at the Wind River Nursery," by A.R. Wilcox.

Lecturer at Ranger School –

As last year, Mr. Munger delivered a few lectures at the Rangers' Short Course at the University of Washington, six on Silviculture and three on Reconnaissance.

Experimental –

Considerable experimental sowing and planting, both with exotic and with native species, has been done during the past year; but as practically all of it has been

directed by the Section of Planting, the discussion of this experiment work, as well as of the extensive planting, is covered by the report of that Section.

Plans for the Coming Year –

The details of the plans for investigative work are to be gone over by the Investigative Committee within a few days, and their recommendations will be embodied in the District Program for Investigative Work, which should reach you by April 15.

Pending the approval of the District Investigative Committee, the plans for the Section of Silvics for the coming year embrace the following projects, some of which have already been described above:

1. The completion of the office work in connection with the **two-year study of western yellow pine** (no more field work necessary), embodying the result in (1) a full office report, taking up in detail a discussion of the growth of the tree. (2) A set of yield tables upon which a system for regulation for the Forests in the yellow pine region may be based. (3) A circular for general distribution among timberland owners, foresters, and the general public, entitled "Western Yellow Pine in Oregon." This work should be completed by April 25.

2. **A Study of the Decadence of White Fir on the Crater National Forest** with a view of determining (a) the underlying cause of the rot, (b) the size of the trees affected, and (c) rapidity of the decay. Information on these points is necessary in order to determine what the wisest timber sale policy is in handling white fir in this locality. The study will be made by Dr. Meinecke, assisted by a Forest Assistant and one or two Field Assistants. Data will also be obtained while the party is on the ground for a volume table and a provisional growth table. It is expected that this study will be commenced in the field by May 1.

3. **A Revision of Bulletin 33, "The Western Hemlock."** This publication is out of print and somewhat out of date, and before it is reprinted, additional data both in the field of Silviculture and of Products should be secured and worked up with the old data. It is proposed to begin an office study of the recent literature on hemlock soon, and start field work in a month or so. Field work will be finished before the close of the fiscal year, and the data worked up during the summer.

4. **Streamflow Experiment.** On the Whitman National Forest, three small creeks, all of which join to form the John Day River near the Blue Mountain Ranger Station, and all of which are very similar as to watershed and cover, offer now an exceptionally good opportunity for the study of streamflow, since one of these watersheds is now just beginning to be logged over, another will be soon, and the third not for some years. It is planned to put a set of weirs, possibly self reading ones, on each of these streams for continued observation during a term of years. Meteorological instruments are already installed at the ranger station.

5. **Continuation of Experimental Work and Re-examination of Plots.** The various lines of experimental plot work already under way will be continued, more plots established, and the old ones re-examined, for the following lines of study particularly:

    1. Sand-dune planting on the Oregon coast.
    2. Brush disposal in yellow pine.
    3. Sheep grazing and yellow pine reproduction.
    4. Intensive study of burnt-over areas in Douglas fir regions.
    5. Rate of growth of Douglas fir stands of various diameters.

6. **Study of Upper Slope Type.** So little is known about the trees of the upper slopes – amabilis fir, noble fir, white pine, etc., which compose so large a part of the forests on the higher Cascades, that it is proposed to make a general study of this type with the object of ascertaining especially the relative merits and rate of growth of the several species, the form of management adapted to this type, their silvical requirements, etc. If possible, methods of cutting will be tried experimentally. This study should fit in with a study of the adaptability of these upper slope species to various purposes, so that they may be introduced into the trade and utilized.

7. **Experiment Station.** Perhaps the most important project which it is contemplated initiating this season is the establishment of an experiment station in the west coast Douglas fir region, probably in the Wind River Valley. The organization of this station and the initiating of the experiments will be an important part of the field season's work. The primal work of this station will be to study nursery methods, seed production, and artificial reforestation problems, for which the proposed location offers unexcelled opportunities. A full discussion of the reasons for favoring the establishment of a station, and for locating it at this place, and the general plan of work is contained in a memorandum, a copy of which is attached.

March 2, 1912.

(Signed) F.E. Ames
Assistant District Forester

(Signed) Thornton T. Munger
Forest Assistant

(Signed) Geo H. Cecil
District Forester