Background Information About the 1930s Inventory

From: Federal Forest Research in the PNW

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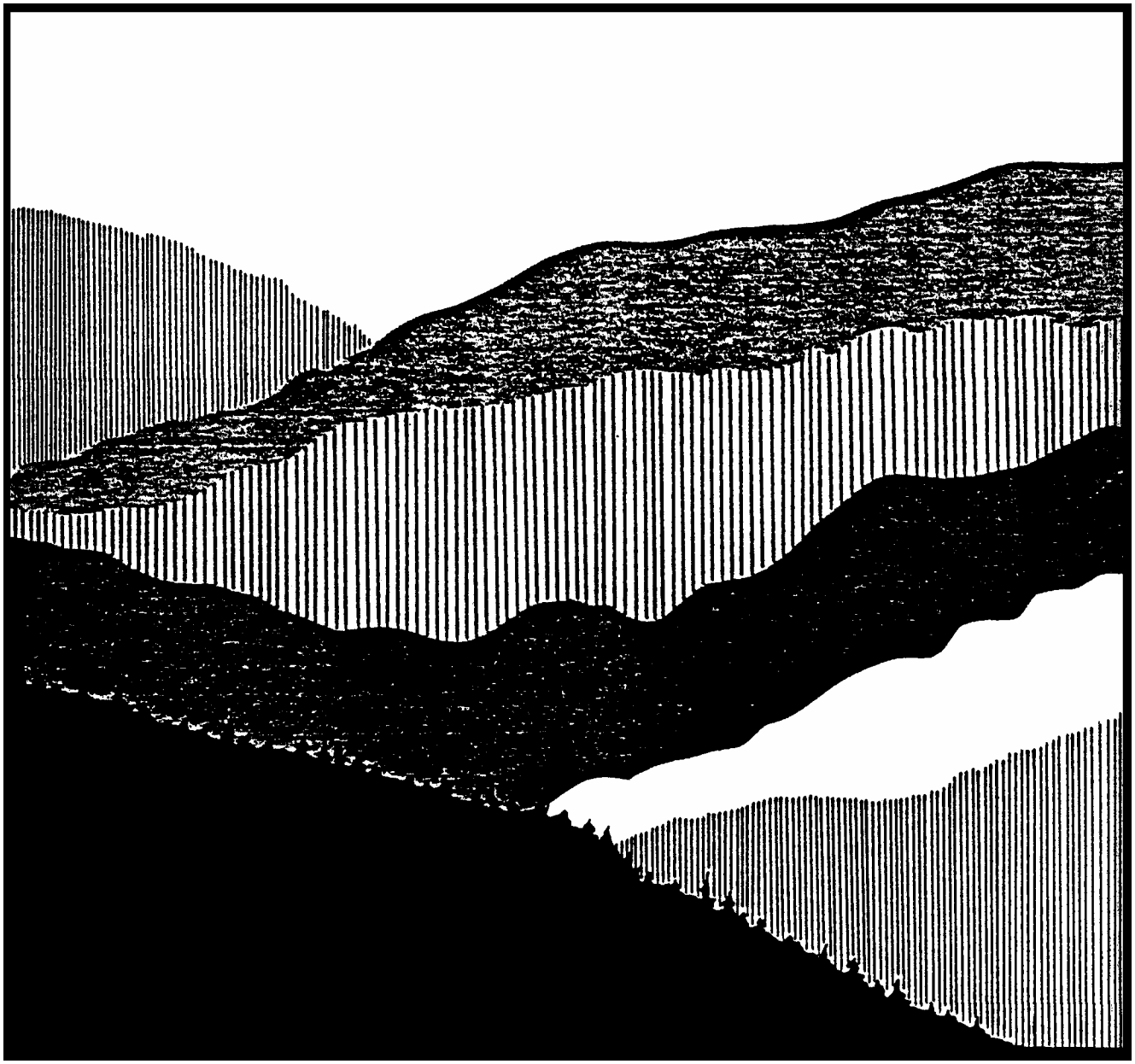

The following section contains paragraphs relevant to the 1930s forest survey from pages 29 – 100 in Robert W. Cowlin. 1988. Federal forest research in the Pacific Northwest: The Pacific Northwest Research Station. Unpublished document distributed by the Pacific Northwest Research Station. 244 p. Note, footnote numbers correspond with those in the original document.

Overshadowing all these accomplishments was the enactment by Congress of the McSweeney-McNary Act of May 22, 1928. This was and remains the most important Federal legislation related to forest research. It contains 10 sections which provided the basic framework for the organization of regional Forest Experiment Stations and named and described the following broad fields of study in separate sections: "forest diseases; forest insects; forest animals, birds, and wildlife; forest fire weather; forest range and watershed; forest products; forest survey; and forest reforestation and economic studies." Annual amounts were authorized for each of the eight fields of study and an overall ceiling was placed on the original forest survey. These amounts seemed generous at the time, particularly when compared with the amounts previously appropriated. As time passed, they proved inadequate and the basic act was amended and supplemented a number of times. However, it still stands as an example of prescient and progressive forest legislation.[10] Senator Charles L. McNary of Oregon was behind this legislation in Congress. At the time, he was in his second term and the acknowledged national leader of forest legislation. Other Oregon and Washington senators and congressmen have followed in his footsteps as leaders in forest legislation.

Actual appropriations were not made under the McSweeney-McNary Act until the fiscal year commencing July 1, 1929. In anticipation of funds forthcoming for the forest survey under Section 9 of the Act, Munger went to Washington in January 1929 to review plans for the forest survey with Washington Office research personnel.

Prior to this time, the nature of the proposed forest inventory had been discussed with the Advisory Council and the Investigative Committee. Both of these groups strongly supported Munger's belief that a forest type map was an essential part of such a project. An allotment of $30,000 for the forest survey was made effective July 1, 1929. This doubled the financial funding for the Station. Staffing commenced immediately with the appointment of Philip A. Briegleb from the junior forester rolls on July 1. Briegleb was detailed to Wind River to work on projects there until the forest survey plans could be finalized. On November 5 of that year, Robert W. Cowlin was appointed as an associated forest economic and Floyd L. Moravets was transferred from District 6 as a junior forester to serve on this project, and Edith A. Parmeter was appointed October 14 as junior clerk to complete the staffing for that year. The remainder of the year this group reviewed literature, defined forest types, investigated sources of information, and commenced preparing working plans under the direct supervision of Director Munger. It was planned to divide the forest survey into four phases, which were: the timber inventory, forest growth phase, forest depletion, and the requirements for forest products. This was in accord with the language of Section 9 of the McSweeney-McNary Act. The Douglas-fir region, the area west of the Cascade Range summit in Oregon and Washington, was selected from all other forest regions of the country as the starting point for this important new project. Since this project was to be extended to other forest regions in future years, considerable attention was directed to the plans and

10 "A National Program of Forest Research," published in 1926 by the American Tree Association for the Society of American Foresters, furnished a "blueprint" for this legislation. It was prepared by Earle H. Clapp as a special report of a special committee on forest research of the Washington Section of the Society of American Foresters. Other members of the committee were R. C. Hall and A. B. Hastings. However, many other foresters, entomologists, plant pathologists, and wood technologists contributed to it. It made an analysis of the forest problems of this country and research needed to solve these problems. It went into great detail of the kinds of research needed, its complexities and interrelationships. The report described existing agencies -- private, public, educational, and institutional -- and current programs and discussed agency needs and responsibilities. It drew certain conclusions and made suggestions for an organic act for forest research in the U.S. Department of Agriculture.

procedures developed and executed here. Furthermore, this region, despite the fact that it contained only about 30 million acres of commercial forest land, was known to have a major share of the Nation's remaining sawtimber volume, most of it in old-growth stands. Since the National Forests contained a large part of the forestland acreage and timber volume, there were prospects that the historical trends of forest resource depletion in the Lake States, East, and South might be averted here. Also, the private lands of this region were generally located in the areas of higher productivity, and there were indications of interest in holding timberlands for continuous timber production by some owners. One of the factors arousing this interest was the passage of "the reforestation land tax bill" by the Oregon Legislature in March 1929.[11] The Fairchild study definitely had some influence in awakening public awareness of the adverse effect of current property tax laws and practices upon private forestland ownership and management.

The sudden collapse of common stock prices on the New York Stock Exchange signaled the beginning of an economic depression that was to endure nearly a decade and that was to result in numerous radical changes in the Nation's economic and social structures and political institutions. Forest resource management, the forest industries, and forest research programs were influenced in a number of ways by the economic forces at work and by Governmental actions.

For several years before 1929, lumber production nationally had been declining. In the Douglas-fir region, volume of lumber production had remained practically stationary from 1926 to 1929. There were signs that the postwar boom of the twenties had run its course. Lumber prices were weakening under slackening demand. Many timber companies were financially overextended with burdensome debt charges on bonded indebtedness. Installed capacity was greatly in excess of that needed to supply national demand. Lumber production nationally declined from 37 billion board feet in 1929 to 26 billion feet in 1930, and the bottom was not in sight. During the same 1-year period, production in the Douglas-fir region dropped from about 10 billion board feet to 7.5 billion board feet. Since the timber industries were by far the leading manufacturing industry in the Pacific Northwest, the impact on this region's economy was severe.

With this stage setting, a strengthening of the economic aspects of forestry in the Station's research program commenced in 1930. The funds allotted to the forest survey more than doubled and other new projects of an economic nature were planned.

On January 6, 1930, Horace J. Andrews was appointed senior forest economist to provide the leadership of the forest survey project. On the same day, Donald N. Matthews was transferred from the Umpqua National Forest of District 6 to assist on the survey. "Hoss" Andrews was particularly well qualified for this position. A graduate of the

11 This law provided the landowner with the option of having cutover land suitable for reforestation classified and withdrawn from ordinary operation of property taxation. The classified lands would pay 5 cents per acre annually and a harvest tax when the merchantable crop was cut.

School of Forestry, University of Michigan, he was Director of the forest land and economic survey of the Michigan State Conservation Department in 1924 and 1925. Following this period, he was Chief Fire Warden and in charge of the State of Michigan Division of Lands until he left to join the Station.

January 1, 1930, District Forester Christopher M. Granger was appointed as Head Forest Economist to be the national director of the forest survey, and later in the month moved his office from District 6 headquarters to the Lewis Building in the Experiment Station suite. With the principal staffing of the survey group completed, the working plan could be developed and fieldwork commenced. A “Digest of the Tentative Working Plan" was prepared for presentation to the Forest Research Council and mailed to members on February 14 a week before the scheduled annual meeting.

Exploration of existing information that might be used in the survey had disclosed that private and public timber cruises were in existence covering practically all the stands of mature commercial timber on lands other than the National Forests and National Parks. From these records, forest type and tentative timber volume could be determined in the office. Field crews type mapped the remaining area, consisting principally of cutover lands, deforested burns, and second-growth stands, by traversing roads, trails, and logging railroads and occupying vantage points. Occasional patches of remnant old-growth forests not covered by records were assigned sawtimber volumes by ocular estimation by the type mapper. Records of areas cut over by date of logging and area of recent deforested burns were available in a number of sources such as State Foresters' offices, fire protection associations, county assessors, and timber owners.

In contrast, the National Forest timberlands were only partly covered by intensive surveys, and these were commonly made in areas where timber sale programs were active. Accordingly, a somewhat different procedure was employed on the National Forests than was used on private lands, although the basic objectives and forest type and timber volume specifications were identical, assuring that the data would be additive. On all lands, each unit of commercial forest land was classified by forest type, site or productivity class, and ownership class, and was assigned a sawtimber volume value for each species if of merchantable quantity. Second-growth stands were classified by 10-year age class and three degrees of stocking; from these data, board-foot and cubic-foot volume could be determined by applying the appropriate yield table. Deforested burns and non-restocked cutover lands were classified as such with the exception of lands cut over within 10 years of the date of the survey which were designated as "recent cutovers." The reasoning was that since Douglas-fir, the principal species, did not produce adequate seed crops each year, no immediate judgment could be made on restocking. At this time, practically all timber harvested was by clearcutting with defective trees[12] left standing which furnished a seed source.

Noncommercial forest lands were classified by ownership class only. Forest lands withdrawn from cutting by statute, such as national parks and primitive areas, were designated as reserved and although timber volume values were assigned to such lands, they were declared unavailable for cutting.

Each National Forest was divided into working circles and compartments. The county was the basic area unit used for lands of other ownership, and forest type and timber volume data were gathered and compiled by township and section. The smallest area unit recognized in classifying by land use, forest type, or ownership was 40 acres. This survey procedure, commonly called the "compilation method," was a contrast to forest survey methods used in European countries such as Sweden and Finland where linear-plot surveys had been made on a national scale. This system consisted of measured plots of a fixed area at certain distances along lines at spaced intervals. Sampling accuracy of the resulting timber volume and forest type or land use area could be determined for large political units such as provinces. On the other hand, the compilation method was not susceptible of accuracy determination and specification by statistical analysis. However, since the region's forest area was to be completely covered by the survey, it was reasoned there would be no sampling error as far as area values were concerned. Obviously, there could be personal errors and bias on the part of field crews, which was also true of surveys by any

12 These trees were culled owing to a high incidence of decay in the lower trunk as a general rule. Such trees were not genetically inferior to the trees that had been harvested.

other method. The fact that forest type maps and localized area and volume data could be obtained by the compilation method outweighed other considerations in the judgment of the Director and survey leaders and this method was adopted. The linear survey system could only yield schematic type maps and generalized area and volume data at the intensity permitted by funds available for the project.

At the annual meeting of the Forest Research Council in February 1930, plans for conducting the forest survey were presented. An entire afternoon was devoted to discussion of the methods to be used, timber volume and area specifications, and how the information was to be released to the public upon completion of the survey. Some members advocated compilation of the data by large watersheds rather than by county. Generally, those advocating this position represented private timberland owners who feared that release of timber volume data by county would prompt taxing officials to increase assessed valuations of private forest land and timber.

During World War I, corporation Federal income tax rates increased tremendously. This required a great expansion of Federal auditing of returns of timber owners, including the valuation they placed upon their timber holdings.[13] The owners were directed to evaluate their timber by quantity, character, and value as of March 1, 1913. Some owners chose to provide the forest survey with this information instead of more recent data. And, too, some private owners, particularly non-operating owners, had only rough estimates of their timber holdings.

The specifications for merchantable timber volume adopted as a regional standard for the survey were generally more rigid than those used in commercial private cruises and in cruises used by the counties for tax assessments. At that time, practically all the county cruises were made by commercial timber cruising firms under contract. Specifications and degrees of statistical reliability of the county cruises varied. Cruises made recently of private timber likewise varied, although generally they were more uniform than the county cruises. However, it was reported that there were substantial differences in timber volume if they were "buying" or "selling" cruises. Practically all the cruises, both county and private, underestimated the volume of the minor species, and in some cases ignored it completely. Timber volume was rarely estimated for the hardwoods, which often occurred as an understory in the conifer old-growth stands or in pure hardwood stands along the river bottoms and other favorable sites.

Obviously, the survey would have to adjust the timber volume data collected from the timber owners and the counties. In nearly all cases, this would mean an increase in total merchantable timber volume for the particular area of forest land covered. Some council member suggested using private cruises only as a sample to adjust county cruises. One member voiced the opinion that release of timber volume estimates by counties might cause county officials to have re-cruises made. Chairman Chapman suggested that the Station collect the data and decide later how it would be released. Other council members pointed out the advantage of having these data by county in planning forest resource development and management. It was pointed out that other economic data were available by county units. However, the Station agreed that all private timber cruise data used would be kept confidential and that it would not be released in any form that would disclose the timber holdings of a single private owner, and that the unit area of release would be the subject of future discussion and decision. Moreover, the Station agreed to qualify the timber volume data released by explicitly defining the standards used which exceeded current commercial practice and therefore was not necessarily economically available. The question of classifying private forest land and timber by accessibility zones was raised and discussed. The British Columbia Forest Service was also conducting a forest survey of the province at this time. Mr. F. D. Mulholland, who was directing this survey, was present and described their system which classified timber volume on the basis of two classes of economic availability.

13 In 1919, David T. Mason was appointed to organize and head the timber valuation section of the Federal Bureau of Internal Revenue.

Granger, Munger, Andrews, and Cowlin attended a meeting of the Forestry Committee of the West Coast Lumbermen's Association to present the plans for the forest survey and discuss them with committee members. The meeting was called by Colonel Greeley[14] who had resigned as Chief of the Forest Service in 1928[15] to become executive head of the association. The "Colonel," as he was respectfully and affectionately known by foresters and timber men, undoubtedly had considerable influence in the high degree of cooperation which the Station obtained from the timber industry in launching the forest survey. His influence was also a positive factor in support of many other Station programs and in gaining the endorsement of the association for the Station generally.

A detailed work plan and fieldwork instructions for the forest survey were completed during the early part of 1930. The first step was location and investigation of sources of information. Lists of large private timberland owners and approximate acreage owned were compiled from several sources. Sources of base map information were located and collection of maps of each county on a 1-mile-to-the-inch scale commenced for use in field type mapping of lands other than National Forests. The Forest Service District Office of Maps and Surveys had on file maps for each of the National Forests. With financial aid from State forestry departments of Oregon and Washington, work was commenced upon compiling the most recent cartographic data to draft new base maps of the two States on a 1/4-inch-to-the-mile scale.

The actual fieldwork of the survey was divided into two sections. Donald N. Matthews was placed in charge of the National Forest section. One or two men from the staff of each National Forest in the Douglas-fir region was assigned to the project. For areas not covered by intensive surveys made for timber sale preparation or land classification and exchange purposes, a field examination was made which consisted of a type map and a timber volume estimate. This was described as an "intensive application of an extensive reconnaissance"[16] (a use of words which might cause a semanticist to wince). About 1920, an extensive reconnaissance of the National Forests in the District had been made and timber volume estimated and compiled. This provided a starting point for the detailed forest survey.

Supervision of the office work and fieldwork on lands other than the National Forests was assigned to Cowlin. Timberland owners were contacted and asked for use of their timberland information. County assessor offices were visited and the job of collecting timber cruise work commenced before mid-1930. Washington County, on the outskirts of Portland, was selected as the first county to be covered, and Briegleb was assigned to it after a brief field training period conducted by Andrews with Cowlin, Matthews, Briegleb, and Moravets to test procedures. Other field tests were made with Munger and Granger as participants to settle final plans for the work. A field school in estimation of defect in Douglas-fir was conducted by Dr. Boyce[17] in early fall for members of the survey staff on the Cascade National Forest near Westfir, Oreg.

With additional funds in sight for fiscal year 1931, three additional men[18] were selected and transferred from other Forest Service Districts shortly before June 30. These men were young professional foresters. Each was assigned a county to work under Cowlin's supervision after a training session. Moravets, who had done a large part of the data collecting process, was also assigned a county.

14 Following World War I, Greeley was commonly referred to by his military title.

15 He was succeeded by Major R. Y. Stuart.

16 An extensive reconnaissance had been made of all Pacific Northwest National Forest lands in 1920-23 to provide timber volume data for the Capper Report.

17 Dr. John S. Boyce transferred from the Bureau of Plant Industry March 1, 1928, to become Director of the Northeastern Forest Experiment Station, U.S. Forest Service, Amherst, Mass. One year later, he resigned to become the first Professor of Forest Pathology at the School of Forestry, Yale University. In 1923, “Decay and Other Losses in Western Oregon and Washington,” U.S.D.A. Technical Bulletin 280, 60 pp., illus., was published under his authorship.

18 Edward D. Buell, Warren H. Bolles, and Paul D. Kemp.

For convenience in the field and facility in compilation and interpretation of the forest survey inventory, growth, and depletion data, the Douglas-fir region was divided into 11 subregional geographic units. With one exception, each of these units contained two or more counties. Generally, one field man was assigned one of these subregions. Or units as they were called. As funds permitted, they were provided with field assistants.

It was evident that the problem of adjusting the timber estimates on private lands to a common standard called for special expertise. With this need in mind, James W. Girard[19] was added to the forest survey staff July 1 as a senior logging engineer. Jim Girard had worked for the Forest Service in other Districts as log scaler, timberman, and logging engineer. and had also worked in the timber industry in similar capacities. He was more or less self-educated, but had not only acquired a wealth of practical woods experience, but had also grasped the fundamentals of forestry by observation and association with professionals. He had an unusual faculty for judging timber volumes by ocular estimation and applying this information to large areas by extensive observation. In the years to come, after working in all parts of this country and some foreign countries examining large tracts of timber, he became a legendary figure among timbermen, if anyone merits this description.

Gerard worked out plans for adjusting the timber cruises used by the forest survey and described the qualifications for the personnel to do this work. The Civil Service Commission, upon representation by the Forest Service, agreed to hold a special examination for a position called "timber expert." It was classified as the equivalent in grade to an associate forester, or P-3 as it was known in the vernacular of the Civil Service.

In the fall of 1930, three timber experts were appointed from the roll established by the examination, which was unassembled. They were Charles W. Kline, William J. Wakeman, and Percy N. Pratt. The first two named were forest school graduates, qualified logging engineers, and with a background of employment in the timber industry. Pratt was a member of a Portland timber cruising firm, Pearson and Grady, and had many years of practical experience.

Work on all parts of the inventory phase of the forest survey could now proceed full steam ahead with the opening of the field season in 1931.

The forest insurance study also got underway in 1930 with the transfer of Harold B. Shepard, senior forest economist from the Washington Office of the Forest Service, on July 1. Work commenced in the Douglas-fir region, and it was planned to extend its application to other forest regions, depending upon the findings of this study, which was the first systematic study of this subject undertaken in this country.

19 Girard also participated in the Westfir training session with Dr. Boyce.

The effects of the Great Depression began to influence Station activities early in 1931. The Station was ordered to withhold expenditure of a portion of appropriated funds during fiscal years 1931 and 1932. In addition, restrictions were placed on promotions, filling of vacancies, and travel. At this time, there was no provision for automatic periodic salary step increases within a Civil Service grade. As a result, salaries of appointed clerical and professional employees were at a stationary or reduced level for a number of years. In July 1932, annual leave was canceled and the "Hoover Holiday," which consisted of 2 days off each month without pay was instituted. Despite these draconian measures, morale of Station personnel remained high; work output did not suffer as many employees did not exercise their rights to the "day off." A moderating condition was the cost of living which did not increase and for some items of necessity decreased in cost.

With the funds available, the forest survey was able to step up its activities and recruit half a dozen or more temporary field assistants, either experienced timber cruisers or graduate foresters who could not find other employment. These men were principally used for the job of adjusting private and county timber cruises; some of them served as compassmen for the permanent staff of "timber experts," and others of greater experience worked in the same capacity as the staff cruisers after a short training period in survey techniques and standards.

Late in 1930, G. H. Lentz of the Southern Forest Experiment Station, which was scheduled to initiate the forest survey in the Southern forest regions, spent some time in Portland reviewing Pacific Northwest methods and problems. He also reviewed with Granger and Girard forest conditions in his area as they related to survey methodology. Lack of existing timber volume information in county (or parish in Louisiana) records and in possession of the many small owners precluded adoption of the compilation method as used in the Pacific Northwest. The more favorable topography and uniformity of stands, absence of areas of high-volume, old-growth forests compared with the Douglas-fir region, and the vast total area of forest land were factors that favored the linear method of survey, and the conclusion was reached to use that method in the South.

This action revived the question of using the linear method in the Douglas-fir region in the minds of Washington Office personnel and Granger. Consequently, it was decided to make a comparative test of the two systems in this region. Lewis County, Washington, one of the larger counties in the region, was selected as the area to be used and work plans were made for the fieldwork. This county extended from the crest of the Cascade Range on the east to the Coast Ranges on the west and included a variety of forest conditions and topography. That portion of the county within the National Forest boundaries was not included since the survey method used for the National Forests was not susceptible to comparison. There was no other choice of method for such forest lands with the funds available because of the rugged nature of the terrain, short field seasons, and relatively poor accessibility.

The test area consisted of 40 townships, approximately 1 million acres, extending from the National Forests[21] on the east to the county boundary on the west. Linear strips were spaced at 3-mile intervals across the county in an east-west direction. Timber volume was estimated on quarter-acre circular plots at 10-chain (660 feet) intervals. Forest type changes were recorded whenever intersected by the strip; however, no length of strip less than approximately 2 chains was considered. Fieldwork was started in January 1931 with a crew consisting of Briegleb, Pratt, and Fire Warden George Herger who was assigned by State Forester Joy of Washington to help on the project. This crew, working in the more accessible part of the county's mixed farm and forest land, tested the techniques. A final working plan based on this crew's experiences was prepared. Fortunately, the winter, although unusually rainy, was not cold, and there was little snow in the low-lying hills of the Chehalis River valley. Later in the year, other crews were added until practically the entire forest survey crews working on the private lands, and some from the National Forests, were in Lewis County. Some crews were composed of three men, and in the more

21 An isolated block of National Forest land called the Mineral Addition was included in the test area.

accessible country two-man crews could be used. All in all, 16 men (not including overhead personnel) were employed on the Lewis County strip survey for 960 man-days in the field, and 900 of these days were spent on the line regardless of weather. Packers, horse and human, were needed in some locations, and line camps could seldom be occupied more than one night. The 8-hour day was unheard of, for in some instances it would take several hours or more to reach the line in the morning and a like amount of time or more to reach the camp, night lodging place, or automobile at the end of the day. In a few cases, crews "bundled" up for the night on the line. Wherever roads permitted, automobiles were used to reach the vicinity of the fieldwork location. Review and transcription of field records was done at night usually, although in a few locations where several crews were quartered in a small-town hotel, it was rumored that penny-ante poker games were an occasional diversion.

Girard spent considerable time in Lewis County after he returned from the South about the first of April. He worked with Kline who was doing the cruising for adjustment of the county and private cruises used in the compilation method. He also spent a few days with some of the crews on the strip survey. Andrews and Girard took over field responsibility for several miles of strip in rough country near the end of the job, spending overnight camping on the line. They claimed a record for ground covered in the allotted time. Director Munger spent a day with one of the strip crews and another day with Girard and Kline on the adjustment cruising.

Buell was responsible for the type mapping portion of the compilation method survey of Lewis County. Working all through the winter on this job, he completed his assignment in April. Cowlin spent considerable time with Buell, and Andrews and Cowlin both worked with the strip crews, visiting each of them together or separately at least once during the course of the work and usually spending 2 days with each crew.

F. X. Schumacher,[22] then on the staff of the Washington Office as a mensurationist, visited the project for several days and was out on the line with Cowlin and the crew headed by Moravets for a strenuous time in rough country. "Schu," as he was known to many, had been successful in a poker game over the weekend at a hotel where a group of the men were staying in Chehalis, the county seat of Lewis County. The next day proved to be "blue" Monday for him as Moravets and Cowlin evened the score by wagering on tree diameters before they were taped. Schu had a tendency to underestimate the large old-growth Douglas-fir.

All of the fieldwork in Lewis County was completed the last half of June. Under Cowlin's supervision, office computations had been organized on a current basis as field records were available. Buell finished computation of the forest type and timber volume data gathered by the compilation method in June for all of Lewis County with a separate summary for the 40-township test area.

Upon completion of the strip survey and computation of the data for the test area in July, Meyer analyzed the sampling errors of the various areas by statistical analysis. It soon became apparent that a reasonable sampling error could be obtained for broad groups of data only. Innumerable combinations of forest type area, site class, stand class, timber volume by species and ownership could be made, but a valid comparison of the two methods could only be made for major items for unit areas as small as a million acres.[23] The comparison showed that for areas of major forest types the two methods were reasonably close, particularly in consideration of the unavoidable differences in field definition of types. The strip method picks up small openings of hardwoods, brush, waters, etc., too small in extent to map in place.

Sawtimber volume estimates by the two methods were reasonably close with the exception of hardwoods. This pointed the way for a refinement in the compilation method to allow for hardwood volume occurring as an understory in the conifer types and for small stringers along stream courses.

22 Francis X. Schumacher was a member of the faculties of the University of California and Duke University teaching forest mensuration. He published many articles on growth and yield of California conifers and sampling methods and a text and reference book with Donald Bruce entitled "Forest Mensuration: McGraw-Hill, New York and London, 1933. 360 pp., illus.

23 A number of counties in the Douglas-fir region were less than a million acres in total land area.

Forest site data for the area by the two methods were very close.

Growth estimates which had been calculated by Meyer were in a reasonable range for the two methods for both total board-foot and cubic-foot volumes, but varied widely for components of ownership and species.

Clapp and Granger came to Portland to participate in the discussion of this test of methods. The decision was made to continue the compilation method, not only for the Douglas-fir region but also for the ponderosa pine region of the Pacific Northwest. The forest survey of the Northern Rocky Mountain region was scheduled to start soon and the compilation method was adopted for that area.

Considerable detail has been accorded this episode in the nationwide forest survey, since it was a unique project in forest research and was precedent setting in treatment of forest resource data. One distinction that bears emphasis is that the size of the unit area for release of forest resource information was not a controlling factor in the compilation method of making surveys as it was in the linear method.

Future sophistications in statistical analysis, data processing, sampling techniques, and aerial survey techniques altered the situation. However, events of the next two decades proved the usefulness of having localized forest resource data for the Pacific Northwest region, a keystone in studies of the Nation's forest resource situation and development of programs of national and regional scope.

Aerial photography in making forest surveys was still in an experimental stage of development at this time. It had been used to some extent in eastern Canada, and the British Columbia forest survey group was studying its use. The latter organization was using amphibious planes extensively to transport men and supplies to interior inaccessible portions of the province. In 1927, Lage Wernstedt,[24] attached to the Region 6 Division of Maps and Surveys, photographed rugged portions of the Mount Baker National Forest from the air, using oblique shots. The film used at that time produced photos that were fuzzy and did not give clear distinction of the forest cover.

Early in 1931, Andrews, Cowlin, and Briegleb made a field study of the usability of a series of vertical aerial photographs taken by Fairchild Airways transecting a township of mixed forest and farm land in Clackamas County, Oregon. Fairchild Airways was a pioneer in promoting the use of aerial photographs in many forms of land use examination. Andrews, Cowlin, and Matthews also studied the use of aerial obliques taken by Lage Wernstedt of another area. Later in the year, Wernstedt photographed a considerable portion of the Siuslaw National Forest in the Coast Ranges of western Oregon. These mountains, although not rising to high altitudes, were greatly dissected by stream courses and ridges. Forest types, although predominately Douglas-fir except near the coast where western hemlock and Sitka spruce dominated, were interspersed with hardwoods, usually red alder (*Alnus rubra*), and open areas of bracken fern and grass. Age classes of the conifers were mixed. Passable roads were infrequent and vantage points where the field crews could overlook large areas were scarce, owing to the topography and density of vegetation. In this situation, the aerial oblique photos served as a feasible and useful adjunct to field type mapping.

Results of the comparison and study of the application of both vertical and oblique photos led to the conclusion by the forest survey staff that although there was a great potential use of forest aerial photography, it could only be used in this survey in a limited manner. With funds available, original vertical photography was prohibitive, and with a few exceptions the less expensive oblique photographs were also too costly. There were few or no aerial photographs taken for other agencies available, as was the case in later years. Sensitive types of film and sophisticated photo interpretation techniques and accessory equipment had not been developed, although it was probable that considerable research in this field was being initiated and conducted by the military agencies even at this early time.

24 Lage Wernstedt, a Swedish born and educated forester, had an absorbing interest in aerial photography. Later in his career, he was on the supervisor's staff of the Mount Baker National Forest as an assistant forester and continued his aerial photography work.

Granger was with the forest survey staff most of July and part of August reviewing the results of the Lewis County comparison of methods, National Forest inventories, and the plans for the growth and depletion phase of the survey. With Andrews, Girard, and Matthews, he spent a week in the field on the Umpqua National Forest. The object of this trip was to devise and test a technique for checking the type maps and timber volume estimates to assure a reasonable degree of accuracy. Later in the year and in 1932, Girard and crews of the Station's timber experts (check cruisers) applied the technique to all the National Forests in the Douglas-fir region. Melvin Bradner of the Northern Rocky Mountain Station came to Portland near the end of July to review all phases of the forest survey with Granger and members of the local forest survey. The forest survey of the Northern Rocky Mountain region was to be initiated soon under Bradner's direction, and the plan was to use essentially the same methods that were being used in the Pacific Northwest. Bradner and Granger also made a field trip to join Kemp who was type mapping Tillamook County, Oreg., and see firsthand the techniques employed.

Early in August, Assistant Chief Clapp came to Portland and participated in the final review of the Lewis County test and decision to continue using the compilation method of forest surveys. Clapp and Granger, with Munger, Andrews, and others of the forest survey staff, tested the "stocked quadrat" method,[29] adopted by the survey, of judging degree of reproduction stocking of cutover lands and deforested burns on a nearby logged-over area.

29 This method was first developed by I.T. Haig and refined by the forest survey. It was used extensively in this and other western forest regions for forest surveys of all kinds.

Fieldwork on the forest survey of the Douglas-fir region neared completion in 1932. The inventory of the National Forest lands was completed during the year and Matthews was transferred to the Station's fire research project. A type map of the Rainier National Park was made by Frank Brockman of the National Park Service, based on fieldwork done the previous year. An estimate of the sawtimber volume of the park was made by Girard during an extensive reconnaissance in the summer of 1931. Although the park and certain other lands, such as the national monuments, were reserved and not subject to commercial cutting, they were included in the forest survey to present complete coverage of the forest resources. Forest resource information on the reserved lands was so designated in forest survey public reports and maps.

Base maps on a quarter-inch-to-the-mile scale were completed for the western halves of Oregon and Washington. Each individual map covered a quarter of a State in order to keep the map to a convenient size for use on table or wall. The compilation and tracings were done by the Region 6 office of Maps and Surveys[31] with the help of many outside agencies and people, including financial cooperation of the States of Oregon and Washington and Region 6 of the Forest Service. Lewis A. (Tam) McArthur, vice president of the Pacific Power & Light Co., Portland, Oreg., gave generously of his time, and carefully checked for accuracy the cartography of each map before the final tracing. "Tam" McArthur was an authority on Northwest geography and author of "Oregon Geographic Names" and many articles on this subject. His knowledge was encyclopedic.

31 Victor H. Flach, in charge of this office, was a major factor in the success of this project.

The completed tracings were sent to Washington, D. C., for lithography in 1932. Although the maps were made primarily as a vehicle for superimposition of forest type delineation by color, they were useful simply as base maps. Nothing of this sort was previously available. Accordingly, an edition of the maps with geographic features in black and blue ink was ordered for public distribution. The half-inch-to-the-mile, hand-colored county maps which the Station was making were in demand. These were made available in blue-line prints to users for duplication and hand-coloring at their own expense. The many requests for these maps confirmed the Station's decision to make type mapping a required part of the forest survey methodology. It also gave the Station a measure of the prospective demand for the final quarter-inch-to-the-mile, colored, lithographed type maps of the two States.

March 10, 1932, the U.S. Senate agreed to Senate Resolution 175, introduced by Senator Royal S. Copeland of New York, which authorized and directed the Secretary of Agriculture to make a comprehensive report on the Nation's forest resources and attendant problems. The Forest Service had been anticipating this action and work had been underway in revising timber volume estimates and other resource data for a year or more. Passage of the resolution quickened this work. In the Pacific Northwest, compilation of the forest survey inventory data had been completed for some areas in the Douglas-fir region which were useful in adjusting previous estimates of timber volume and forestland areas and condition. Other Station projects contributed valuable data. Munger, Meyer, Wilson, Brandstrom, and Cowlin devoted much time in late summer assembling data for the "Copeland" study. In September 1932, Brandstrom went to Madison, Wis., to collaborate with Kirkland on preparation and report writing on the subject of private forestry for inclusion in the report. Director Munger left October 1 for Washington, D.C., to stay until mid-December on other phases of the Copeland study.

Matthews' first assignment in his new position was the completion of the fire depletion phase of the forest survey of the Douglas-fir region. This work was closely interrelated with the fire damage studies and the forest fire insurance project. The latter study was in a finishing stage and was awaiting availability of the forest survey inventory totals for the preparation of the final report for the Douglas-fir region. At the same time, Shepard was completing plans for extending the insurance study to the pine region of eastern Oregon and Washington. Fieldwork there was commenced in early summer and extended through most of the fall.

Early in 1932, a conference was held in Portland on the "requirements" phase of the forest survey, directed by F. J. Hallauer of the Washington Office who was conducting this work on a national basis. The purpose of the requirements phase was "to determine the present consumption and the probable future trends in requirements for timber and other forest products." A study of such a scope and character did not lend itself to separate regional studies, and the task of the various regional forest survey groups was to determine and provide information on relevant local practices and conditions for integration and analysis at the national level. Attendants at the conference included Melvin Bradner of Northern Rocky Mountain Station and Carey Hill of the California Station in addition to local Forest Survey and Products men. Following the conference, Lodewick spent a good part of the year in analyzing past consumption of lumber for single-family dwellings and garages in the Pacific Northwest. He learned that a revamping of the working plan and field procedures for the sake of simplicity was needed before extending the study to other uses of wood products and commencing similar studies in other parts of the country.

The fiscal situation was a "mixed bag" in 1933. Effective April 1, salaries of all regular Federal employees were reduced 15 percent. This salary cut was restored in three equal installments on March 16 and July 1, 1934, and April 1, 1935. and the savings impounded. To make matters worse, allotment of regular appropriated funds was reduced with the net effect that at that end of fiscal year 1934, the Station received about $51,500, or 60 percent less than the previous fiscal year. It was necessary to terminate all temporary employees and practice strict

economies in travel, supplies, etc. The fiscal situation changed suddenly with the enactment of legislation providing funds for civil work programs to give jobs to the jobless and to prime the pump for recovery of the private sector of the economy.

President Roosevelt's interest in conservation of the country's natural resources directed a substantial part of these measures to forestry programs on public lands including research. This was also the "year of the alphabet," and appellations attached to the various programs and acts were commonly shortened to key letters.

The ECW[37] legislation and programs were first, and in May 1933 funds were made available indirectly to the Station under this authority. The CCC[38] camps and personnel were a part of this general program. Three men, all experienced foresters,[39] were made ECW foremen and assigned to work under C. W. Kline's supervision to make detailed topographic maps and timber volume estimates of the Wind River and Pringle Falls Experimental Forests. Crews of CCC enrollees[40] from nearby camps were assigned to assist these three men, later increased to six. The Wind River project was practically completed, but the Pringle Falls project languished because the local CCC camp was discontinued. However, basic land survey was completed, facilitating later mapping and timber estimating work.

Later in the year, direct allotment of ECW funds was made to the Station, permitting the reemployment of temporary workers laid off and the employment of additional temporary field assistants and scientific aides who assisted in the large volume of computational work that had accumulated on the forest survey, other forest economic projects, fire and silvicultural projects, and mensuration studies.

In October and November, funds and people were made available to the Station under additional Federal legislation supplementing the ECW Act. These were known as Impnira[41] and CWA[42] funds. This greatly bolstered all research activities of the Station, although it created many additional administrative problems, including budgetary accounting and personnel management. June Wertz and the capable regular clerical force coped with the problem, freeing professional people to carry on research with a minimum of disruption.

The NIRA funds were principally used to finance the forest survey and skilled people could be selected. However, some anomalous and difficult personnel situations developed. For example, six former field assistants were reemployed as NIRA technicians, qualified as junior foresters. Under regulations imposed by the NRA administration, their pay scale was fixed at $2,600 per annum. At the same time, junior foresters under regular appointment, including some with more than 4 years of service, were still being paid $2,000 per annum, the entrance salary less the 15-percent cut. Naturally, there were gripes mixed with bewilderment at the ways of bureaucracy, but the work went on and the quality of research did not suffer.

Progress on the forest survey speeded up with the additional field and office staff. Fieldwork on the Douglas-fir region inventory was completed. The working plan for the inventory of the ponderosa pine region was revised and tested in the field early in 1933. In this region, the same man was responsible for the work on all lands in a county, regardless of ownership. There were no separate crews for the National Forests. By midsummer, work was well started in central Oregon.

37 Emergency Civil Works; authorized by the Unemployment Relief Act of March 31, 1933.

38 Civilian Conservation Corps, also authorized by the above Act.

39 W. E. Griffee, C. V. Zaayer, and Lloyd H. De Groote. Later, Griffee and Zaayer joined the staff of the Western Pine Association. Bill Griffee became its secretary-manager in 1959 and remained in that post until the Western Wood Products Association was formed through consolidation with the West Coast Lumbermen's Association.

40 Occasionally. forest school students were located among enrollees. Other enrollees developed an interest in forestry from work in the Corps and later studied forestry at the college level.

41 The National Recovery Act (NRA, the Blue Eagle Act) of June 16, 1933. The administering body was the National Industrial Recovery Agency, NIRA.

42 The Civil Works Administration.

Compilation of the basic inventory data for the Douglas-fir region was completed and preparation of statistical reports commenced. A supply of the 1/4-inch-to-the-mile lithograph base maps was received and distributed to cooperators. The hand-colored generalized 1/2-inch-to-the-mile type maps covering each of the 38 counties in the Douglas-fir region were proving useful to many agencies. Interest in land use planning was developing at State and local government levels. Requests were being received for special compilation of forest resource information in analyzing justification for public works programs such as river and harbor improvements.

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Fiscal arrangements continued to be an important factor in conducting an orderly and balanced research program at the Station during 1934. Administration of the emergency funds was becoming more complex with frequent changes in rules and regulations concerning use of the funds and personnel employable under the several programs. June Wertz became very competent in the intricacies of the financial situation and successfully kept the Station financing and budgetary records in order. The CWA program was terminated April 26, 1934; however, April 1 an ECW allotment of funds to the Station permitted transfer of most of the people to ECW financing.

Some research programs were better adapted by nature of the work to use emergency money and people than others, although in the long run, all or nearly all of the Station's active studies received some benefits. The forest survey in particular and the other economic programs to considerable extent profited by the emergency work funds and people. Andrews, an able administrator and an innovative researcher uninhibited by bureaucratic red tape, grasped the opportunity to speed the progress of the survey and enlarge the scope of its coverage in the form of reports, type maps, and special studies. He also gave the Director strong support and assistance in managing the Station's budget problems. Others of the survey regular staff likewise had strong supervisory talents. The new public domain project and related land use planning activities were also able to use CWA crews effectively, gathering tax delinquency data at county seats and transferring the data to county maps. This work was done in cooperation with the Washington State Agricultural Experiment Stations, starting late in 1933 and continuing through the first half of 1934.

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Completion of the fieldwork and computation of the forest survey inventory data cleared the decks for publication of results. There was no longer any noticeable objection to release of timber volume data by counties. Attitudes of the timber industry had changed materially, probably partly as a consequence of the existing economic conditions and partly as a realization that such basic forest resource data were needed by private and public agencies alike to plan courses of action to restore the forest-based economy of the Pacific Northwest to a healthy condition.

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Acting Assistant Chief Marsh[46] of the Washington Office was in Portland for several weeks and devoted a major part of his time to the forest survey. The scope of the final regional report for the Douglas-fir region was discussed in a conference with Munger, Andrews, and Cowlin. Later, Marsh and Cowlin discussed an outline of the proposed report in detail. The latter completed a draft of the introductory chapter of the report giving scope, methodology, and specifications by the summer's end. In the general conference, it was decided to present complete inventory, growth, and depletion data for each of the 11 units or regions.[47] It was also decided to issue as a Station mimeographed publication, a mini-report for each of these units. Near the end of the year, when final growth and depletion data were available, Cowlin completed a draft of the report for the North Puget Sound unit.

By late summer, Johnson and Lodewick of the Products group completed the cutting depletion estimates and Matthews the fire depletion estimates, and projections of future forest depletion or drain (as some writers call it) were made. This provided the basis for Meyer to complete forest survey growth projections for the Douglas-fir region and the 11 units.

Lodewick continued to gather information for the requirements phase of the survey, expanding the work to rural and industrial usage and needs. Survey of farm needs was done in cooperation with the State colleges of agriculture.

The forest survey program of map production moved into a final stage in 1934. Half-inch-to-the-mile generalized and 1-inch-to-the-mile detailed type maps had been completed for each county in the Douglas-fir region. Arrangements had been made for making these maps available to prospective users in blue-line print form at their own expense by making vandyke negatives and lending them to commercial blueprinting companies. The Station provided a mimeographed forest type legend and instructions for coloring. Many public and private users, including a number of timber companies, took advantage of this service.

The forest survey's 48 detailed types for the Douglas-fir and ponderosa pine regions were consolidated into 25 types for presentation on the quarter-inch-to-the-mile type maps. The four western quarters of the two States included all of the Douglas-fir region and extreme western part of the ponderosa pine region. The crest of the Cascade Range forms the boundary dividing the two forest regions and is also the eastern boundary of all counties in the Douglas-fir region, except Skamania County, Washington, and Hood River and Jackson Counties, Oregon. The first two named border the Columbia River and extend a comparatively short distance east of the Cascades. Jackson County borders California on the south where the Cascade Range crest is indistinct. In this county's extreme eastern part, forest types are dominated by ponderosa pine.

Fieldwork in the portion of the ponderosa pine region appearing on maps of the west half was completed in 1934. In December of that year, George T. Wilkinson of the U.S. Geological Survey, an authority on lithography and engraving, spent 10 days in Portland with the survey staff advising on procedures in preparing maps for color

46 Earle H. Clapp was made Associate Chief of the Forest Service about this time, leaving the position of Assistant Chief in charge of Research.

47 The matter of nomenclature becomes confusing as the term "region" is popularly used in describing varying areas. That is the reason the forest survey adopted the term "units" to apply to groups of counties in the Douglas-fir region having homogeneity.

lithography. Color combinations and patterns were selected with his help and a legend was decided upon. Soon after, draftsmen started work preparing the copy which would be furnished the Geological Survey in Washington, D.C., for lithography.

Forest survey fieldwork moved ahead in the ponderosa pine region during the summer and fall. After the crews returned in November, Moravets directed half a dozen NIRA and ECW workers gathering advance data – ownership data, timber cruises, maps, and aerial photos[48] in preparation for completing fieldwork of the inventory phase of the survey during the next field season.

48 Wernstedt had taken aerial photos of portions of the National Forests recently and some photos were becoming available from other sources. These photos were a valuable adjunct to the field men.

In August of 1934, Miss Jean Kerr, an assistant editor of the Washington Office of the Forest Service, was moved to Portland for an indefinite detail. The Station had several major publications in office report form and others in the offing. Previously, publications for printing by the Government Printing Office and certain other major publications planned for other outlets received final editing in the Washington Office. This procedure was laborious and time consuming, involving considerable exchange of correspondence or an author's trip to Washington, D.C., or occasionally both.

The forest survey completed all fieldwork in the ponderosa pine region late in 1935. In the office, work was progressing on the compilation of inventory, growth, and depletion data gathered in previous years, so that results could be released promptly. Experience in the Douglas-fir region had shown that use of this information was increasing greatly in planning activities, in programs to restore stability in the timber industry, in public works programs, and in the other Station economic studies. There was a lively interest by some midwestern and eastern financial institutions in effecting a merger of companies in the Douglas-fir region to bring financially weak companies under stronger ownership. Responsible leaders in the industry were advocating Federal Government acquisition of large blocks of old-growth Douglas-fir that were not operable under current conditions and which were a heavy burden on the owners.

From the beginning of the forest survey, industry members of the Advisory Council had suggested that the sawtimber inventory be classified or qualified in some way to show that much of it was not operable under current conditions and, in fact, a considerable portion could not be exploited commercially for many years. After the survey had been in progress for several years, the survey staff developed a classification and plan for rating inventory board-foot regional totals by three classes of economic availability. Two ownership classes were recognized. National Forest and "all other" (the great majority, private ownership), and three species groups, Douglas-fir, pulp species, and all other species. Girard assisted by Kline and Wakeman in collaboration with Bruce E. Hoffman[51] of the Regional Office, did the classifying.

51 Hoffman, logging engineer, Timber Management, Region 6, was detailed to the Station for several months to work on this project. He had extensive knowledge of conditions on the National Forests and other lands.

In December 1935, the Station published a mimeographed report on the pulpwood situation in the Pacific Northwest, based upon forest survey findings.[54]

Experience on the growth and yield studies, other mensurational and silvicultural studies, the mill-scale studies, and the forest survey disclosed the need for more expertise in modem techniques of statistical analysis and experimental design such as Dr. Meyer possessed. The Washington Office Branch of Research was initiating an in-Service training program at this time to fill this gap which was prevalent at the field stations. Briegleb was selected to attend the forest measurements training session held in Washington in December 1935. This anticipated the resignation of Dr. W. H. Meyer, effective January 1, 1936, to join the faculty of the College of Forestry, University of Washington. This was the beginning of a long and distinguished career by Meyer in forest education at the universities of Washington and Yale.

54 Pulpwood Resources of Western Oregon and Western Washington. Forest Research Notes No 17. Mimeo. Dec. 10, 1935. H. J. Andrews, R. W. Cowlin, F. L Moravets, and W. H. Meyer.

With fieldwork on all phases of the forest survey completed during 1936, the staff could put in full time on report writing, map preparation, and answering the numerous inquiries for special information regarding the forest-land and timber resources. The success of the county report program for the Douglas-fir region prompted the writing of similar reports for forested counties of the pine region. Staff members in charge of the fieldwork for a county were also assigned the report writing job.

Supplies of the lithographed 1/4-inch-to-the-mile colored type maps were received for three of the quarter-State maps for Washington and two for Oregon. The remaining three quarter-State maps were still in process by the lithographer at year end. These maps were the first of the kind ever done on such a large scale in this country. Copies were distributed free of charge to cooperators, public and quasi-public agencies, and put on sale to others desiring copies. A nominal charge of $1 a copy was made to narrow the demand to legitimate requests. Funds received were returned to the Treasury as miscellaneous receipts.

Findings of the growth phase of the forest survey were analyzed and published June 1, 1936, in mimeographed form as Station Forest Research Notes No 20, "Forest Growth in the Douglas-fir Region," by W. H. Meyer, P. A. Briegleb, and the forest survey staff. Four kinds of growth calculation were made and presented in estimates of board-foot (Scribner) and cubic-foot volumes. These were (1) current annual growth; (2) realizable mean annual growth, an approximation of the growth that will actually occur in the future under forest practice prevailing in the past;[61] (3) potential annual growth, the average annual growth that could be obtained on the whole of the region's commercial forest land under intensive forest practice; and (4) periodic growth, the estimated growth in a 10-year period.

Throughout 1936, Andrews and Cowlin were giving major attention to writing the final forest survey report for the Douglas-fir region. Since this was the first regional report of its kind to be undertaken by the Forest Service, there were many questions of policy and procedure to be resolved. Earlier report on the extent and condition of the Nation's forest resource by broad forest regions did not have the benefit of comprehensive and authoritative information and the burden it placed upon the analyst. Early in the year, drafts of several of the beginning chapters and a sample of the 11 regional unit reports which had been prepared by various members of the staff were sent to the Washington Office for preliminary review. It was the original intent to issue these unit reports in conjunction with the regional report as a publication of the Government Printing Office. It was decided that for the sake of brevity and speed in publication, the unit reports would be issued as Station mimeographs for local audiences. It was agreed that a greatly condensed statement be included in the final regional report, describing special features

61 Realizable growth was a new concept developed by Dr. W. H. Meyer. R. D. Garver, who replaced Granger as national head of the forest survey, and Dan S. A. Dana, on leave from the University of Michigan and currently a consultant to the Washington Office Division of Economics, visited the Station the fall of 1936 to review the forest survey reporting program and other activities. Garver questioned the realizable growth concept. Fortunately, Meyer was present to explain it in detail. Dana, a keen and perceptive scholar, grasped the concept at once and joined the survey staff in convincing Garver that it was a valid and useful growth calculation.

and conditions in six major districts of the region formed by combinations of the 11 units. It was also decided that the regional report itself should be made as brief as possible. A large part of Miss Jean Kerr's time was spent in editing forest survey reports. Other Station authors were also in line for her attentions. It was evident that professional editing was a full-time need at the Station, and Miss Kerr's detail to the Station was prolonged.

Several personnel changes of 1936 were noted earlier. In addition, Pratt, the last of three original timber experts to remain on the staff, transferred on July 1 to the Northern Rocky Mountain Station where the forest survey staff was being enlarged As the nature of the forest survey program was changing with completion of the fieldwork, staff changes were appropriate.

Losses of personnel were sustained, too, during this year. Paul D. Kemp, associate forester, was transferred to the forest survey project at the Northern Rocky Mountain Station on March 31. At this time, Region 1 and the Northern Rocky Mountain Forest Experiment Station had responsibility for Stevens, Pend Oreille, and Spokane Counties in extreme northeastern Washington. This condition necessitated close coordination of forest survey specifications and procedures between the two Stations in order to have uniform State statistical totals and type maps. Bradner and DeJarnette of the Northern Rocky Mountain Station had made a number of trips to this region and knew Pacific Northwest Station procedures and personnel well.

During 1937, the final report of the forest survey for the Douglas-fir region was completed and sent to the Regional Office for review before forwarding to Washington for approval and publication. Editing was done in Portland by Jean Kerr.

Work commenced on keeping the survey current during the summer in Clatsop County, Oreg., and Grays Harbor County, Wash. The original survey of these two counties was done in 1931 and 1932. Heavy cutting had taken place in the comparatively short time that had elapsed, significantly altering the forest resource. The McSweeney-McNary Act as amended provided authority and funds for keeping the survey current. In the Pacific Northwest, the interval between periodic surveys could be varied to meet the situation in a particular county, a shorter period in counties where depletion was heavy and a longer period in counties where changes were not as severe. Work in Grays Harbor and Clatsop Counties furnished experience for perfecting survey techniques in both field and office work. Fieldwork in Grays Harbor was completed in December 1937 in spite of a record monthly rainfall of 26 inches.

County reports for each of the forested counties in the ponderosa pine region were completed and released in 1937. These reports gave the basic forest inventory data.

Briegleb was devoting a large part of his time in 1937 to completing the growth phase of the forest survey of the pine region in addition to many other current mensurational studies. Many complex computational problems appeared. Alinement charts for estimating in various pine types were constructed. In the fall, Briegleb spent several days in Missoula with the Northern Rocky Mountain staff discussing correlation of growth techniques between the two regions.

Andrews spent the month of May in the Washington Office, ostensibly to discuss final review of the forest survey Douglas-fir regional report and other Station matters. There is no doubt his career prospects in Forest Research and elsewhere in the Forest Service was a subject of discussion. Many at the Station and elsewhere in the Pacific

Northwest assumed that he would succeed Munger, since he had handled a difficult situation as Acting Director for a year or more very well and had previously demonstrated his capabilities as a forest research administrator and scholar as regional head of the forest survey and participant in related land economic studies and programs. "Hoss" Andrews was direct and candid with his associates in the Forest Service and the forest industries. He believed in getting at the heart of a problem and had no time for technical verbiage. He was not hesitant to state his position with equivocation, and if he disagreed with a Forest Service policy or decision in which he was involved or had knowledge, he would speak out spelling out his reasons. It may be that these characteristics obscured his abilities to analyze a forest problem and to seek all the pertinent facts before reaching a conclusion. There were reports that Andrews was being considered for the position of Associate Regional Forester in an eastern forest region since he had extensive previous experience with the State of Michigan and other Middle Western States.[67]

67 The writer has good reason to believe Andrews understood he was going to be offered a position in National Forest Administration involving a grade promotion upon his return from Washington. However, no positive offer was made during the summer of 1938.

In many respects, this change of commands marked the passing of an era in the history of Forest Service research in the Pacific Northwest. Prior to 1924, research was organized as a rule on the basis of individual projects conducted by silviculturists or other biologists or by engineers doing forest products work. These men worked with considerable latitude and freedom from close direct supervision and gave almost exclusive attention to work on their projects. When the Experiment Stations were established in the early 192O's, the skeleton of an organized research system was created. The first directors were selected largely on their proven ability as research project scientists, and with small research staffs the administrative burden was comparatively light, leaving time and opportunities for personal research. As funds increased and the scope of the study program widened and personnel increased in number, the situation changed. By the mid-193O's, administrative duties were occupying nearly all of the directors' time. Meetings, conferences, seminars, and a steady stream of professional visitors from abroad and this country seeking information on research methods and findings, usually people of a professional stature that demanded a director's personal attention, preempted a considerable amount of time. The Washington Office of the Forest Service was starting to exercise stricter controls and making field inspections of study program conduct. More of the directors' time had to be given to public relations activities and personal contacts to gain legislative support for the Stations' work. At least, that appeared to be the situation here when Munger, who found this type of responsibility burdensome and in some cases downright unpleasant, decided to return to a position where he could be more intimately connected with the actual research work.

When Andrews left, Robert W. Cowlin was placed in his position as Chief of the Division of Forest Survey. The last of the 1/4-inch quarter-State colored lithographed type maps, that of northeastern Washington, was completed and the supply received for public distribution. This quarter-State had been held up to include type mapping of the three Washington counties that were part of the Northern Rocky Mountain Station territory, and also because of a poor color run on the proof copies. The report writing phase for the pine region was well along. Forest inventory statistical reports were issued for each county. The final comprehensive report for the Douglas-fir region was received for revision after Washington Office review, corrections made, and the manuscript returned for publication by the Government Printing Office. Requests for special compilations and analyses of forest survey data had reached such proportions that one man was occupied nearly full time performing this service. Among the special

jobs, there were two in 1938 that were highly important. One was a special compilation of timber inventory, depletion, and growth statistical data for use in the Northern Pacific Railroad Co. controverted lands case. Owing to its Servicewide importance, this work took precedence over all other activities of the survey for 2 months. The other was preparation of forest-land and timber statistics covering the Pacific Northwest for inclusion in a national report to a joint congressional committee created by Senate Concurrent Resolution, adopted June 13, 1938, to study the forest situation in the United States. Although this study was not of the dimensions of the Copeland Report, it did present authoritative statistics on the forest resource, making use of forest survey data which were now available for the most important timber-producing region in the country.

Completion of the initial forest survey of the Douglas-fir and ponderosa pine regions made available reliable and detailed information on the forest inventory, rate of depletion by cutting and fire, and rate of growth by forest-land ownership class localized for areas as small as a county. Less was known concerning endemic losses of timber volume and growth potential from insects, disease, and windthrow. However, records of losses from epidemics and catastrophes, such as the Olympic blowdown, were reasonably reliable. Need for greater attention to these problems was recognized but would have to wait for increased funds for manpower and physical facilities.

With the forest survey information at hand, problems in forest management and protection, forest products utilization, and forest economics could be put in perspective and quantified. Completion of the forest fire insurance study by Shepard was a one-time thing which could be put on the reference shelf for other people and agencies to use when economic and political conditions were appropriate. The forest taxation studies by Wilson and DeVries, although of longer life and more pertinent than the insurance study, were soon to reach the stage where action

agencies and legislatures should take over and free the forest economics research staff to tackle many other pressing problems.

Availability of the wealth of forest survey localized information on the forest resource was timely and indispensable for the various depression-born agencies active in land use planning at the county, State, and regional level. It was also essential to cost-benefit analyses in planning public works such as development of hydroelectric power-generating facilities, river and harbor improvements, flood control measures, and extension of overland and water transportation systems. Timber companies and supporting industries, including banks and investment companies, were other users and beneficiaries of these data in industrial planning.

No new study programs were undertaken during 1939 and no major publications were completed or published. Because of restriction from a tighter fiscal situation and rising costs, it was a time for settling down and getting into gear after the changes in command. With the economic recovery process underway after the 1938 recession,[1] emergency funds were being either phased out or reduced. Allotment of regular funds remained at about the same level as the previous year with two exceptions: funds for the forest survey were reduced about one-third and the money was diverted to other Stations where this work was being initiated or accelerated. This was anticipated as the re-inventory work in this region was of lower priority. On the other hand, flood control funds were sharply increased over the amounts received previously. In view of this increase, Raymond H. Chapler was appointed as Senior Forester in Charge of Flood Control Surveys in the middle of the year. Chapler was secretary-manager of the Oregon Forest Fire Association for a number of years prior to joining the Station. However, he had been in National Forest Administration in earlier years. About the same time, Junior Forester Dunford transferred to the Rocky Mountain Forest Experiment Station where he started a career in watershed management research that was to bring him back to this Station years later.

1 Under the aegis of Roosevelt’s administration, deficit spending was used to solve the Depression's economic problems. In 1938, Roosevelt balanced the Federal budget and the economy faltered, and the term "recession" was added to the economist’s vocabulary. In 1939, financing of recovery jobs was renewed, although the Station's research program was not noticeably benefited.

The forest survey staff completed a draft of a comprehensive report on the forest resources of the ponderosa pine region of Oregon and Washington in the fall of 1939 for review prior to publication. The corresponding report for the Douglas-fir region was moving slowly through the publication channels. Re-inventory of the Douglas-fir region was moving ahead; one of the counties completed was Snohomish County, Wash. Availability of up-to-date information proved useful to the fire control case study of that county. Among a number of special studies completed by the forest survey staff during the year was supplying information to the Washington State Planning Council and the Regional Office for use in studies of a proposal for a Cascade Mountains National Park.[7] This proposal originated with the National Park Service and its more militant supporters. The North Cascades proposal was reported to be a part of a greater plan to establish a series of national parks surrounding each of the snow-capped peaks of the Cascade Range from the Canadian border to the California line; each of these parks was to be connected by a strip of park land along the crest of the Range. Some of the more ambitious of the proposal's advocates suggested it might be extended along the Sierra Nevada in California. The Washington State Planning Council staff considered this proposal and requested the forest resource analysis by the Station. The Council recommended against the park proposal, urging that the land remain in National Forest.[8]

7 In 1937, the Director of the U.S. National Park Service appointed a committee to investigate the park potential of the North Cascades. Frank A. Kittridge, regional director of the Park Service, headquartered in San Francisco, was active in this effort.

8 The Olympic National Park was established by President Roosevelt under the Act of June 29, 1938, containing the lion's share of the Mount Olympus Primitive Area, which had been established on the Olympic National Forest in 1935. The Act of June 29, 1938, also authorized the President to make additions to the park from adjoining National Forest lands. By proclamation, President Roosevelt made additions to the park on January 2, 1940, and May 29, 1943. Walter H. Horning, formerly on the forest faculty of the Iowa State College, Ames, Iowa, and insure adequacy of raw material but also contribute to control of the problem of overproduction during flush markets for timber products.

By 1940, serious attention was being given nationwide to taking stock of the strength of our national defense position. In the Pacific Northwest, plans were made to analyze the role of forest and range land resources and plan for their effective use in the defense program.

Nearly every year since the Station was established, visitors from this region, other forest regions in the United States, and from abroad came to Portland to learn of the Station's work in the office and field. The year 1940 had its usual quota or more, including a number of foreign visitors. Ordinarily, this would not appear unusual, but in view of the European political climate, a few drew special attention. Dr. Adelbert Ebner, a German forester, spent some time in the Pacific Northwest, ostensibly representing the German Library of Information[11] in New York City, which was reputed to be a part of the Nazi propaganda organization. He showed an unusual interest in the forest survey type maps of Oregon and Washington and requested copies. Acting upon instructions, the Station told him they would be mailed to him at New York. His request was sent on to the Washington Office for action there. Another cloak and dagger event was the appearance of two Finnish foresters whose names and actions seemed to arouse suspicion that their background was more German than Finnish. They left Portland to travel leisurely down the Oregon coast for California by private auto, reportedly under surveillance of the FBI, who occupied neighboring offices to the Station on the fourth floor of the Federal Courthouse in Portland.

11 Recalled from memory of the author and confirmed by P.A. Briegleb.

The forest survey section continued the re-inventory program of the Douglas-fir region at the rate of about six counties a year. County statistical reports were being issued and distributed within about 6 months' time after completion of the fieldwork.

The year 1940 was a big one for major forest survey publications. "Forest Resources of the Douglas-Fir Region," U.S.D.A. Misc. Pub. 389, by Andrews and Cowlin, was published in December of that year. This was the first of the comprehensive regional reports issued by the nationwide forest survey. A State report, "Forest Resources of Washington," by Cowlin and Moravets, was printed and distributed by the Division of Forestry , Washington Department of Natural Resources. Briegleb's "Forest Growth in the Ponderosa Pine Region of Oregon and Washington" was issued June 1940 as the Station's Forest Survey Report No 78. It was issued as a multi-graphed paper to expedite dissemination of this information, which was very timely in view of the public concern for the future growth prospects to supply the pine timber industry in this region. This was to be followed by a comprehensive regional report. The manuscript, entitled "The Ponderosa Pine Region of Oregon and Washington.” by Cowlin, Briegleb, and Moravets, was in final form and was transmitted late in the year to the Washington Office for review and approval for printing. However, this report was fated to be edited in Washington, and a year or two was required to respond to editorial questions and changes, galley proof and page proof review, and making necessary corrections. From the time since the forest survey was initiated, the Station had followed a policy of using technical journals, trade journals, public addresses, and the press to distribute information on survey methodology, preliminary findings, and selected items of current interest. This policy and internal Forest Service use of forest survey data and conclusions drawn from them gave wide currency to up-to-date information on the forest resources of the Pacific Northwest.

Late in the year, U.S.D.A. Misc. Pub. 490, "Forest Resources of the Ponderosa Pine Region of Washington and Oregon," by Cowlin, Briegleb, and Moravets, was printed by the G.P.0. However, copies for public distribution were not received until early 1943. This completed the set of two comprehensive regional reports giving the results of the initial forest survey of the Pacific Northwest forest resources.