MARKETING PULPWOOD IN THE NORTH CENTRAL REGION

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY

Robert S. Manthy

1963

THESIS

This is to certify that the

thesis entitled

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presented by

Robert S. Manthy

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Forestry

Leo M. James
Major professor

Date January 8, 1964

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ABSTRACT

MARKETING PULPWOOD IN THE NORTH CENTRAL REGION

by Robert Sigmund Manthy

This report is an analysis of the marketing of pulpwood in the North Central region. It is based on a portion of the field data collected during the year 1960 for the North Central Regional Research Project NCM-27, "Timber Products Marketing in Selected Areas of the North Central Region."

The objectives of this study are (1) to evaluate the efficiency with which the present pulpwood marketing system conveys pulp mill demands to producers and to move producers' supplies to concentrators and manufacturers, (2) to determine the costs and margins of moving pulpwood from the stump to the pulp mill, and (3) to determine possible changes in the present marketing system which might increase marketing efficiencies.

Study areas were selected in nine cooperating states--Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio and Wisconsin--to cover an area of active timber production. Detailed interviews were held with representatives of firms at three levels of the marketing chain--producer, intermediate market agent (dealer) and primary manufacturer. Approximately three-fourths of the existing Lake States and one-third of the Central States mills were sampled. Twenty dealers, 157 producers and 40 producer-dealers were interviewed.

Central States mills draw their wood supplies from relatively localized timbersheds, ranging in size from 20 to 100 miles. Nearly all transportation is by truck. Sampled Minnesota mills reach out an

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average of 108 miles; Michigan mills 236 miles; and Wisconsin mills, 475 miles. Nearly 60 percent of the pulpwood purchased by Lake States mills is transported by rail. Many rail hauls which are more expensive than truck hauls are used because of nonprice advantages.

The procurement system relied on most heavily by pulp mills is one of direct purchases from producers. Lake States mills obtain 57 percent of their pulpwood supplies from producers, Central States mills, 86 percent. The average producer contract is approximately 200 cords. The average dealer contract, 2,300 cords.

The percentage of receipts obtained from producers is increasing. Many pulp companies cannot produce pulpwood as cheaply as independent producers. Wood procurement costs normally are higher per cord of producer supplied wood than for dealer supplied wood, but pulp companies which are shifting purchases from dealers to producers feel that the nonprice benefits of the producer system exceed its costs.

About 40 percent of the producers depend on timber production for their full livelihood; the remaining 60 percent are part-time operators. Inability to obtain larger and more stable contracts is a chronic grievance. There is also a need for more stability in seasonal and year to year quotas. Larger and more stable contracts are required for efficient production, to hold a stable, efficient labor force, and to raise the economic levels of those engaged in pulpwood production.

Existing pulpwood prices do not pose special problems for the large-scale, specialized producers with stable contracts. Their earnings are more dependent on the ability to obtain full and efficient

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Present pulpwood procurement policies which lead to widespread use of seasonal pulpwood producers can be viewed in one sense as socially desirable in that they offer some earnings to a great number of rural workers. However, it might be more socially desirable for pulp companies to limit the number of contracts to a smaller number of producers and to assist these producers to lower costs and more stable and higher incomes through the use of efficient machinery and sustained production.

MARKETING PULPWOOD IN THE NORTH CENTRAL REGION

by

Robert S. Manthy

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

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Department of Forestry

1963

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FOREWORD

This report is based on a portion of the field data collected during the year 1960 by the North Central Regional Technical Committee as part of the Cooperative Regional Research Project, NCM-27, "Timber Products Marketing in Selected Areas of the North Central Region."

Nine state agricultural experiment stations--Illinios, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin--participated in the overall project. The Central States Forest Experiment Station and the Lake States Forest Experiment Station of the U. S. Forest Service cooperated.

The project was supported in part by regional funds provided under Title I, section 9b3, of the Bankhead-Jones Act, as amended August 14, 1946, and the Hatch Act, as amended August 11, 1955.

Cooperating states followed a uniform approach. Localized study areas were selected in each state. Standardized interview schedules were developed for use at each market stage considered in the study--producer, intermediate market agent, and primary manufacturer. Definitions and procedures including sampling were standardized. Agreement was reached to obtain coverage of the following wood-products industries: lumber, face veneer, container veneer, cooperage, wood pulp, and posts, poles and piling.

This report, the third in a series of timber-products reports, is limited to an analysis of pulpwood marketing in selected areas of Michigan, Wisconsin, Minnesota, Ohio, Indiana, Illinois, Iowa, Kansas, and Missouri.

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The author wishes to express his gratitude to the members of the North Central Regional Technical Committee who contributed the field data used in this report. The writer is particularly indebted to Dr. Lee M. James for the immeasurable amounts of encouragement, advice and guidance given during the preparation of this manuscript. The writer also wishes to thank his wife, Carol, for her help in the preparation of this report and for her seemingly endless patience.

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CHAPTER I

INTRODUCTION

Twenty-five percent of the nation's wood-pulp producing capacity is located within the boundaries of the North Central region. Many thousands of full-time and seasonal workers earn their livelihood or a portion of it by supplying the wood requirements of the pulp and paper industry. In 1961 the region's 71 pulp mills consumed 3.9 million cords of pulpwood worth an estimated $84 million. At least 10,000 man-years of labor were required to move this pulpwood from forest lands to pulp mills.

Pulpwood[1] is the major commercially harvested timber product in the Lake States. More than 3 million cords of pulpwood, with a delivered value of some $78 million, were harvested in the Lake States in 1961. Pulpwood is a relatively minor forest product in the Central States, but it does have importance in localized forest areas.

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[1] Pulpwood is any wood which has been prepared for use in the manufacture of wood pulp. Wood pulp, in turn, is used in the manufacture of paper, paperboard and other cellulose products. In its commonly accepted usage the term pulpwood refers to a round-wood product which has been cleared of limbs and cut into bolts ranging from 4 to 8 feet in length and from 4 to 10 inches in diameter at the small end. Other forms of wood which are utilized in the manufacture of wood pulp are distinguished from "pulpwood" and are identified either according to the form in which they are received at the mill (chips) or by origin (sawmill residues). In this report the term pulpwood is used in its generally accepted meaning.

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Objectives

Despite the importance of pulpwood as a commercial timber-product, relatively little is known about the operation of the pulpwood marketing chain. Pulpwood marketing has the function of moving pulpwood to consumers in the desired form and conditions at the lowest possible costs consistent with reasonable returns to resources involved. The purpose of this report is to describe the North Central pulpwood marketing system and to evaluate how effectively the functions of pulpwood marketing are fulfilled. The three primary objectives of this study are:

1. To evaluate the efficiency with which the present marketing system for pulpwood conveys wood-user demands to producers and to move producers' supplies to concentrators and manufacturers.
2. To determine the costs and margins of moving pulpwood from the stump to the consumer.
3. To determine possible changes in the present marketing chain which might raise marketing efficiencies.

Study Areas

Study areas were delineated within each state participating in the regional project (Figure 1). They were selected, not to provide a statistical sampling of the region as a whole, but to provide coverage in each state of an area of active timber production. Attention was given to scattering the study areas so that a diversity of market conditions would be sampled.

Boundary lines of study areas were not considered to be rigid. Market agents outside the delineated areas were included in the

Fig. 1. Location of study areas in the North Central region in which pulpwood marketing was sampled.

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sampling when their activities were found to be heavily influenced by marketing within a study area or if they, in turn, exerted a substantial influence on marketing activities within a study area.

Procedure

Detailed interviews were held in 1960 with representatives of firms at three levels of the marketing chain--producer, intermediate market agent, and primary manufacturer. Interview schedules were standardized for each market level, and identical schedules were used in all states.[2] Interest was focused on data for the year 1959.

A 100-percent sample of primary manufacturers and intermediate market agents was sought. Producers were sampled in each study area only to the extent that the investigator felt was necessary for a reasonable cross-section.

Problems of definition required arbitrary decisions. Agreement was reached as to the distinctions among producer, intermediate market agent and primary manufacturer, and the treatment of firms which exercised more than one role in the market.

A producer was defined as an individual (or firm) who harvests purchased stumpage or stumpage from his own land and sells the cut product roadside or delivered to a designated point without substantially changing its form. For pulpwood, bark peeling was not considered a substantial change of the round product.

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[2] Interview schedules used are appended to this report.

Two types of intermediate market agents were recognized. These were first- and second-stage intermediate market agents. Few active second-stage intermediate market agents handling pulpwood were found within the region.

A first-stage intermediate market agent was defined as an individual (or firm) who purchases cut products from a producer and sells them without substantially changing their form. For pulpwood, bark peeling would not be considered a substantial change of form. These firms sell their products to second-stage intermediate agents or to primary manufacturers.

Second-stage intermediate market agents are individuals (or firms) who purchase products from other intermediate market agents and sell to primary manufacturers.

A primary manufacturer or processor was defined as a firm that sells its products only after performing some type of processing operation which substantially changes their original form. Wood pulping mills, generally integrated with paper and board mills, usually constitute the primary stage of manufacture for pulpwood.

Only one type of dual role was associated with interviewed market agents. Many of the sampled producers of pulpwood also act as dealers. These "producer-dealers" purchase cut products from other independent producers and sell these products along with material that they have harvested as producers.

Producer-dealers were interviewed both as producers and as dealers. For example, a firm purchasing 1,000 cords of pulpwood as a dealer and harvesting 2,000 cords from its own or purchased stumpage

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was sampled both as a producer and as a dealer. The firm would be recorded as a dealer in regard to its activities associated with the purchase and sale of the 1,000 cords of pulpwood. The firm would also be regarded as a producer in regard to its activities associated with the 2,000 cords of pulpwood harvested from stumpage.

Pulp and paper companies were not classified as producers of pulpwood if they obtained raw material by harvesting their own or purchased stumpage.

Sample Size

The total regional sample of producers, dealers, producer-dealers and primary manufacturers is shown in Table 1. Forty-seven pulp and paper establishments--representing two-thirds of the primary manufacturers of wood pulp within the region--were included in the sample. Approximately three-fourths of the existing Lake States mills and one-third of the Central States mills were sampled.

Twenty dealers, 157 producers and 40 producer-dealers were interviewed. By separating producer from dealer activities, it was possible to add the 40 producer-dealers to both the producer and dealer samples.

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Table 1--Total regional sample of firms handling pulpwood by study area and market role, 1960.

Study area	Primary manufacturer	Dealer	Producer	Producer-dealer
Michigan	9	13	76	17
Wisconsin	25	15	26	16
Minnesota	6	12	22	2
Lake States	40	40	124	35
Ohio	1	8	8	
Indiana	1		6	1
Illinois	2	1	6	
Iowa	2		11	
Kansas[a]	1		2	
Central States	7	9	33	1
North Central	47	49	157	36

[a]Firms drawing wood supplies from the Kansas study area were actually located in Missouri.

CHAPTER II

REVIEW OF THE LITERATURE

Research in the marketing of forest products has generally taken one of three broad forms. These are (1) a description of the marketing of a particular commodity in which the movement of the commodity in question is followed from the stump to the primary or final consumer, (2) a general description of the markets for and the marketing chains of a number of products, usually within a given geographic area, and (3) a description of one of the marketing institutions operating within the marketing chain for one of more commodities.

Marketing research in pulpwood has generally been confined to the first two of these classes. Few publications, however, have been devoted exclusively to a description of the marketing system for pulpwood. The major portion of the research in the marketing of pulpwood occurs in general descriptions of the markets for and marketing of forest products within a particular geographic area. Descriptions of marketing methods of individual institutions involved in pulpwood marketing are scarce, but a number of studies have been made which investigate the efficiency of the pulpwood production process.

The first portion of this literature review is concerned with research in the marketing of pulpwood in the United States. A review of the literature concerned with a general description of the marketing of a number of forest products (including pulpwood) will follow. Due to the large number of such studies, only those pertaining to the

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North Central region will be discussed. The final section of this chapter is concerned with analyses of the efficiency of pulpwood harvesting operation.

Marketing of Pulpwood

An early description of the marketing of pulpwood was provided by a committee appointed by the General Assembly of the State of North Carolina to investigate unsubstantiated allegations of monopolistic tendencies in the purchase of pulpwood and pulpwood stumpage (Thomson, 1943). It was shown that virtually all of the pulpwood produced in South Carolina was shipped to mills by "contractors" who were assigned exclusive wood procurement territories by pulp mills.

The functions of the contractor varied. Most functioned as brokers (or commission agents) but a few were actually producers. Broker-contractors received a commission for marketing services rendered. These are described as: (1) acting as an agent between pulp companies and pulpwood producers, (2) supervising the loading and shipping of pulpwood, (3) financing producers, and (4) assisting producers in locating and purchasing stumpage.

Contractors who functioned as intermediate market agents were usually paid a commission on all wood shipped to pulp mills from their assigned areas, even though they may not have handled the wood or arranged for the shipment. Producers who were not recognized contractors but who shipped pulpwood directly to pulp mills usually received the same prices that broker-contractors were authorized to pay their suppliers. This policy was defended by pulp mills on the grounds that

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it discouraged independent producers from shipping directly to pulp mills, thereby avoiding problems of irregular deliveries and uncertainty of supply.

A study by Parker and Aull (1953) shows that the marketing system for South Carolina pulpwood had not changed during the decade of 1940 to 1950. In a survey designed to ascertain the methods by which and the channels through which farmer owned sawtimber and pulpwood was marketed it was found that stumpage sales were made to local producers and that producers, in turn, marketed harvested pulpwood through contractors who were granted dealerships by pulp companies. A survey of pulpwood selling practices in Georgia conducted by Hamilton and others (1957) also found the producer-contractor-mill marketing chain to be the prevailing method of pulpwood marketing.

The authors of both of these studies concluded that landowners can maximize the returns for stumpage sales by adhering to the following general rules: (1) know the quantity and quality of what is being sold, (2) secure two or more bids on timber to be sold, (3) use written contracts for all stumpage sales and (4) exercise the right of control over the logging and hauling operations. Based on the finding that 50 percent of the landowners sampled initiated stumpage sales, Hamilton also concluded (although somewhat naively) that "this indicated that the pulp and paper industry's dealer-producer system is rather effective and serves its industry well."

In his book, The Economic Problems of Forestry in the Appalachian Region (1949), Duerr presents an analytical description of pulpwood marketing in Kentucky, North Carolina, Tennessee, Virginia and West

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Virginia. According to Duerr, the Appalachian region's pulp mills obtain some of their pulpwood requirements from small landowners who harvest their own stumpage but that the major portion of their wood supplies are obtained from a group of agents which are commonly known as "contractors." A pulp mill's contractor-suppliers are usually assigned a definite procurement territory, such as a county or group of counties, and are frequently discouraged from selling pulpwood to other mills.

The marketing functions and services performed by these so-called contractors vary. It is claimed that some contractors procure wood supplies from independent producers and therefore function as intermediate market agents. Others are simply large producers who harvest purchased stumpage or who purchase stumpage and subcontract logging and hauling operations. Still others function both as intermediate agents and as producers by obtaining part of their wood supplies from their own or subcontracted logging operations and some from independent producers. Regardless of marketing services, contractors do not function as brokers or commission agents; they are free to negotiate their own prices for wood they purchase.

Duerr concludes that the major fault of the contractor system as it was found to be operating in the Appalachian region is that it tended to encourage unnecessary "pyramiding" of market functionaries. Pyramiding occurs when a pulp mill's contractor contracts with someone else to obtain and deliver a specified quantity of wood at a specified price. These "subcontractors," in turn, may also contract with still a third party to obtain and deliver the specified quantity of wood. Duerr concludes that each layer of the contractor pyramid adds to the

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total cost of marketing pulpwood, thereby reducing the returns to the producer who actually does the cutting and the returns to stumpage owners.

Jeffords (1956) investigated trends in the marketing of pine pulpwood in Georgia, Florida and Alabama. Particular emphasis was given to the recent use of railwood yards. The railwood yard, which is defined as "a tract of land with mechanized loading equipment to transfer wood from trucks to railroad cars on the siding that is located on the land," was first put into operation in the South in mid 1951. By 1956 the number of rail yards operated by contractors or dealers and by pulp mills had grown to approximately 120.

The rapid growth of rail yards is explained by Jeffords primarily in terms of the advantages it offers to producers and to pulp mills. For producers, the advantages of the rail yard are specified as: (1) the producer sees his wood scaled and knows what is culled, (2) any quantity of wood may be sold, (3) payment is received upon delivery, and (4) mechanical unloading of trucks reduces truck unloading time. It is claimed that before the introduction of this marketing facility producers who shipped wood to pulp mills by rail were required to load a whole car of pulpwood before shipment to the mill, and had to wait for payment until the rail car was delivered to the mill and scaled. The author claims that the use of rail yards offers three principal advantages to the pulp mill: (1) establishment of a rail yard can stimulate production in the area surrounding the yard, (2) mills can maintain inventories of stored wood which permits better control over the flow of wood to their plants, and (3) during periods of railroad car shortages wood is still accepted.

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Jeffords also indicated that many southern pulp mills face a "rather serious problem" in their inability to obtain a continuous supply of pulpwood in the summer months. The author claims that this can be directly attributed to the fact that thinnings and partial cuttings are usually done in the winter when the problems of insect damage and fire danger are at a minimum, and that farmer-landowners cut only during the winter when they have free time. It is suggested that the most economical method by which pulp mills can be assured of a continuous supply of pulpwood in the summer months is by arranging cutting schedules on company owned lands so that most of the yearly cut is done during the summer months.

Busch, in an investigation of the problems of pulpwood production and marketing in Alabama (1956), claims that the seasonal nature of pulpwood production and deliveries is generated by pulp mills rather than by the seasonal nature of production. The author claims that because climatic conditions cause stored wood to deteriorate rapidly, most southern mills place heavy seasonal demands on producers by ordering pulpwood during the winter months and then curtail demand when inventories are full. The seasonal nature of pulpwood demand is viewed as short-sighted, resulting in wide fluctuations in woods labor requirements, insecure "feast or famine" employment for producers and the loss of workers who prefer more stable work and therefore move to other occupations. As a solution to this problem, Busch suggests that mills should carry at least a two months' inventory, stored under water if necessary, so that a fully employed, full-time year-round specialized labor force could be used to supply wood in a more uniform manner.

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In a 1947 study of pulpwood production and marketing in the Lake States, McNutt estimates that 85 percent of the labor force required to harvest Lake States pulpwood was part-time, transient operators. It is suggested that employment of available pulpwood producing technology would considerably reduce the severity of seasonal swings in pulpwood production and marketing, but that the seasonal nature of pulp mill demand discouraged production by highly mechanized year-round producers. The potential long-run benefits of a highly mechanized pulpwood supply industry are summarized as follows:

> No realist counts on cheaper wood as a result of mechanization. His efforts are directed toward fewer but better trained men, each one of whom will work more months per year. Mechanization will provide a means to a most desirable end.

A comprehensive analysis of pulpwood marketing in Michigan has been provided in a series of studies by Lee M. James and Gordon D. Lewis. James initiated the series in 1954 and 1955 when he investigated the market operations of the three principals of the pulpwood marketing chain--landowners, market agents, and pulp mills. The results of this study were published in 1957. It was shown that approximately 40 percent of the pulpwood produced in Michigan in 1954 was channeled to pulp mills through intermediate market agents (brokers) who usually served as agents for a number of mills. The remaining 60 percent was marketed by producers who sold directly to pulp mills. Producers, due to the relatively small volumes handled (averaging less than 300 cords), generally sold only to one mill.

By comparing pulpwood prices with costs of production reported by market agents sampled, James concluded that the margins available to

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producers for risk and profit were greatest for spruce and balsam fir and least for aspen and paper birch. Production of pine was shown to be relatively more profitable than production of aspen but less profitable than production of balsam fir. A more recent (1961) investigation of costs and returns by Lewis and James shows similar results.

According to James, most pulp mills which purchase Michigan produced wood rely on a combination of producer and dealer contracts for required supplies. Dealers are generally used as an agent source for pulpwood which is produced at distances in excess of 100 miles from the mill. Lewis (1961) found that Michigan producers who handle less than 125 cords per year generally market their pulpwood through dealers whereas producers who handle more than 125 cords usually bypass intermediate agents and sell directly to pulp mills. However, he further states, that, in reality:

> The transition between marketing through a middleman and marketing direct to mill would not be a definite quantity, but rather a range of volumes whose extent depends upon the pulp mill procurement policies and procedures and the producer's knowledge of pulpwood marketing.

In 1960, James and Lewis published a study undertaken to determine the comparative advantage of railroad transport of pulpwood as opposed to truck transport. The need for such a study was demonstrated by James in his 1957 study of pulpwood marketing in Michigan. The authors concluded that there is no single point or mileage zone below which it is more economical to transport wood by truck and above which it is more economical to transport by rail. Instead, the break-even point was shown to be highly variable, depending on such

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factors as specific mill locations, highways and rail loading points available, specific railroads and numbers of carriers involved, and bargaining abilities of those involved in rate negotiations.

The methods by which pulpwood is channeled from the landowner to pulp mills in the Tennessee Valley appear to be quite similar to marketing methods of Michigan pulpwood as reported by James and Lewis. Schnell (1958) reports that pulp mills which draw wood supplies from the Tennessee Valley obtain wood from both independent producers and from recognized dealers. Dealer wood is purchased from more distant timbersheds whereas independent producers are usually the source of wood produced within relatively short distances from the mill.

Incidental Studies of Pulpwood Marketing

Data describing the forest resources, production statistics and markets for forest products have been published in each of the nine states within the North Central region. Most of these have been primarily concerned with timber resources and forest landownership patterns.

Reports based upon forest surveys carried out by the Lake States and Central States Forest Experiment Stations generally include short descriptions of the production and markets for forest products.

A report on Michigan's forest resources (Findell, 1960) shows that approximately 70 percent of Michigan's 1954 pulpwood harvest was from poletimber trees; the remaining 30 percent came from sawtimber trees and the tops of sawlog material. In a study of Wisconsin's forest resources, Stone and Thorne (1961) reported that the pulp and

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paper industry is the largest importer of wood to Wisconsin. More pulpwood is shipped into Wisconsin than is produced within the state. It was also shown that the volume of state pulpwood production exceeds that cut for any other commercial product, although the cut for fuelwood exceeded the total volume of both pulpwood and sawlogs. Roughly one third of the pulpwood harvested in Minnesota is shipped to Wisconsin mills (Cunningham, 1958).

Other reports have been prepared for Indiana (Hutchison, 1956), Iowa (Thornton and Morgan, 1959), Ohio (Hutchison and Morgan, 1956) and Missouri (King, 1949). Most of these reports indicate that pulpwood is usually harvested by farmers and other seasonal operators who frequently obtain stumpage from their own lands.

State agricultural experiment stations and the U. S. Forest Service experiment stations within the North Central region have also been interested in the marketing of forest products. Studies by these institutions usually have been devoted almost exclusively to the specification of what types of markets are available to farm woodland owners and to the enumeration of procedures that such owners should follow in selling their timber in order to maximize their returns and at the same time maintain or improve the productivity of their woodlots. Studies aimed specifically at the farm and other small private woodland owners have been published in Illinois (Hutchison and Winters, 1951), Iowa (Quigley and Yoho, 1957), Ohio (Turner and Mitchell, 1950) and Missouri (Quigley, 1950).

Holland's study of timber products marketing in the claypan region of Illinois describes the marketing of pulpwood in somewhat more

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detail (1962). Data presented in Holland's analysis was collected in conjunction with the North Central Region Marketing study, "Marketing Timber Products in the North Central Region" (NCM-27). The author found that marketing of pulpwood in the claypan region is poorly organized. Timber owners were found to assume a passive role and timber buyers an active role, with each transaction being negotiated by itself. Holland concludes that greater participation by woodland owners in the negotiation, preparation and administration of timber sales would improve the efficiency of timber marketing.

Marketing Agents

Descriptions of the functions of market agents operating within the pulpwood marketing chain have been largely confined to analyses of producer operations. These studies all but ignore the marketing activities of producers. Instead, interest is focused on a quantitative or qualitative aspect of the pulpwood production process.

Studies which specify the nature of factors affecting logging costs (such as harvested volume per acre, characteristics of site, and road conditions) have been much more common than qualitative studies which indicate the numerical affect of quantitative variables. Because of the scarcity of qualitative studies and the limited applicability of quantitative studies, relatively little is known about the importance of and the relationships between individual factors of production employed in the pulpwood harvesting operation, i.e. the pulpwood production function.

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In 1960, J. S. Hensel of the American Pulpwood Association published five case studies of pulpwood harvesting operations in the Lake States. While these studies are reported in considerably more detail than the typical case study, their usefulness is rather limited. Each of these studies is a quantitative description of the operations of large volume, highly mechanized producers. In terms of total number of producers harvesting pulpwood in the Lake States, this type of operator is rare.

Studies of producer operations reported by Zillgit (1950), Fixmer (1960), and Pfeifer (1961) are examples of studies of an even more restricted nature. Each of these investigators were primarily concerned with labor requirements of pulpwood operations within delineated geographic areas. Little or no attention was given to other factors of production or to the influence of variable site conditions.

In Pulpwooding With Less Manpower, Guttenberg and Perry (1957) investigate the labor requirements for several systems of pulpwooding in various southern timber types. Time studies were done in the pine flatwoods of Arkansas, the rolling hills of central Mississippi and in Mississippi's bottom land hardwoods. Labor requirements for each step of the pulpwood production process were estimated by regression analysis. Factors such as tree diameter, stand density and cut per acre were dependent variables. Other than for a brief quantitative description and an estimate of average hourly costs, capital (machinery) requirements of the various operations studies received relatively little attention. As the title of their publication suggests, the authors were primarily interested in labor costs. They concluded that

professional, highly mechanized year-round producers operating 5 to 10 man logging crews can produce pulpwood at a lower cost than seasonal producers or smaller, less capital intensive year-round producers and are "probably destined to be the mainstay of the industry."

A similar but more detailed study was undertaken by Schnell in the Tennessee Valley (1961). Schnell's study was designed to determine the total costs of producing and marketing pulpwood under varying logging conditions. Data were collected from 24 pulpwood harvesting operations in a wide geographic area--12 in Tennessee, 5 in Alabama, 3 in North Carolina, 3 in Georgia and 1 in Mississippi. Crew sizes of sampled operators varied from 2 to 7 men.

Time and related cost data were collected for each of the five physical steps involved in the production and sale of pulpwood: (1) felling, limbing and bucking, (2) skidding, (3) loading, (4) hauling and (5) unloading. Because he was dealing with a heterogeneous sample, Schnell was forced to aggregate diverse inputs into two variables--labor and capital equipment. Using these data production functions were developed for each step in the production and marketing process. Resulting data are presented in a manner which allows producers to estimate per cord production costs simply by supplying their own cost data. No attempt was made to rank or evaluate the efficiency of different methods of operation.

CHAPTER III

THE PULP, PAPER AND BOARD INDUSTRY IN THE NORTH CENTRAL REGION

About a fourth of the wood-pulp producing plants in the United States are located within the nine states of the North Central region. Seventy-one plants, owned by 57 companies, are located within the region--51 in the Lake States and 20 in the Central States. In the aggregate, these plants consumed about 4 million cords of pulpwood in 1961.

Most of the wood pulp manufactured within the region is produced and consumed in vertically integrated plants which manufacture paper or paperboard. However, less than one-half of all establishments engaged in the production of paper and board from wood fibers maintain wood pulping facilities.

The 1958 Census of Manufactures lists 230 establishments primarily engaged in the manufacture of paper and board in the North Central region--102 in the Lake States and 128 in the Central States (Table 2). Only 59, or 30 percent, of these plants are vertically integrated establishments producing and consuming wood pulp at the paper or paperboard mill site. The remaining 171 paper and board plants either utilize other fibrous materials such as waste paper as a basic raw material or obtain wood pulp from external sources. About 40 percent of the wood pulp consumed within the region is imported from other regions of the United States, Canada, or Europe.

Table 2.--Paper
1958

State
Michigan
Wisconsin
Minnesota
Lake States
Ohio
Indiana
Illinois
Iowa
Missouri
Kansas
Central Stat
North Central

Source:
States: 1958, P

Table 2.--Paper and board plants in the North Central region, by state, 1958

State	Paper mills	Paperboard and building paper and board mills	All paper and board mills
		(Number of establishments)	
Michigan	22	22	44
Wisconsin	38	9	47
Minnesota	5	6	11
Lake States	65	37	102
Ohio	19	39	58
Indiana	--	14	14
Illinois	2	30	32
Iowa	--	4	4
Missouri	1	10	11
Kansas	7	2	9
Central States	29	99	128
North Central	94	136	230

Source: U. S. Bureau of the Census. U. S. Census of Manufactures: 1958, Pulp, paper, and board, Industry Report MC58(2)-26A, 1961.

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The Paper and Paperboard Industry

A wide variety of paper products ranging from fine papers to roofing felt are produced within the North Central region. Paper manufacturers tend to specialize in the production of fine, book, and sanitary papers. More than 50 percent of total paper output is classified in these grades. Significant volumes of construction paper, insulating board and hardboard are produced within the region, but container board and other paperboard are the primary products of paperboard plants.

North Central mills account for 23 percent of national paper production and 22 percent of national paperboard production (Table 3). Within the region paper production is concentrated in the Lake States. Wisconsin alone produces nearly one-half of the region's paper output. Ohio, with 19 percent of the regional paper output, is the only substantial producer of paper in the Central States. Paperboard production is more evenly divided between the Lake States and Central States.

The relative concentration of regional paper production in the Lake States can be attributed to both the number and size of paper mills in this area. The Lake States have more mills (69 percent of the total) and larger output per mill. Average annual output of Lake States paper mills is 44,000 tons; the corresponding figure for Central States mills is 25,000 tons.

Paperboard mills are far more numerous in the Central States (73 percent of the total), but the great difference in size enables the Lake States to manufacture nearly as much paperboard as the Central States. Average annual output of board mills in the Lake States is 55,000 tons; the corresponding figure for Central States mills is 23,000 tons.

TABLE 3.--Paper and pa
by state, 19

State	
Michigan	
Wisconsin	
Minnesota	
Lake States	
Ohio	
Indiana	
Illinois	
Iowa	
Missouri	
Kansas	
Central States	
North Central	
Total U. S.	

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Source: U.
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Table 3.--Paper and paperboard production in the North Central region, by state, 1961

State	Total all grades	Paper	Paper-board[a]
		(Thousand tons)	
Michigan	1,828	748	1,080
Wisconsin	2,252	1,766	486
Minnesota	850	367	483
Lake States	4,930	2,881	2,049
Ohio	1,679	686	993
Indiana	364	D	D
Illinois	828	D	756[b]
Iowa	D	-	D
Missouri	D	-	D
Kansas	D	-	D
Central States	3,059	768	2,291
North Central	7,989	3,649	4,340
Total U. S.	35,585	15,741	19,844

D Withheld.

[a]Total includes 26,000 tons of wet machine board and 868,000 tons of building paper and board.

[b]Excludes withheld wet machine board production.

Source: U. S. Bureau of the Census. Pulp, paper, and board, Industry Report M26A(61)-13, 1961.

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Fibrous Material Consumption

Wood pulp is the single most important fibrous material consumed by the region's paper and board industry; waste paper runs a close second. In 1958, the region's paper and board industry consumed 3.8 million tons of wood pulp and 3.9 million tons of other fibrous materials, primarily waste paper. Fibrous materials consumption by state is presented in Table 4. Table 5 presents a breakdown of wood pulp consumption by type of wood pulp.

Only two states--Wisconsin and Minnesota--consume more wood pulp than other fibrous materials in paper and board manufacture. The Lake States as a whole use nearly twice as much wood pulp as other fibrous materials, but the Central States use nearly three times as much of other fibrous materials as wood pulp.

The North Central region makes relatively heavier use of other fibrous materials than other regions. Fifty-one percent of the tonnage of fibrous materials consumed in the region is in fibrous materials other than wood pulp. The corresponding percentages in other regions are 44 in the Northeast, 14 in the South, and 22 in the West.

Nearly 40 percent of the wood pulp consumed by the North Central paper and board industry is imported into the region. With the exception of Wisconsin, imports of wood pulp are large in relation to production throughout the region.

Table 4.--Fibrous materials consumed in the manufacture of paper and board, by state, 1958

State	Wood pulp	Other fibrous materials		
		Total	Waste paper	Other materials[a]
	(Thousand tons)			
Michigan	797	893	852	41
Wisconsin	1,282	370	350	20
Minnesota	839	284	D	D
Lake States	2,918	1,547	D	D
Ohio	638	746	613	133
Indiana	33	257	176	81
Illinois	150	1,080	996	84
Iowa	D	124	98	25
Missouri	D	D	D	D
Kansas	D	D	D	-
Central States	843	2,324	D	D
North Central	3,761	3,871	3,458	413

D Withheld.

[a]Includes rags, manila and straw.

Source: U. S. Bureau of the Census. U. S. Census of Manufactures: 1958, Pulp, paper, and board, Industry Report MC58(2)-26A, 1961.

Table 5.--Type of wo
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State	S
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Wisconsin	
Minnesota	
Lake States	
Ohio	
Indiana	
Illinios	
Iowa	
Missouri	
Kansas	
Central States	
North Central	

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Source: U.
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Table 5.--Type of wood pulp consumed in the manufacture of paper and board in the North Central region, by state, 1958

State	Sulfite[a]	Sulfate[b]	Ground wood	Semi-chemical	Other
		(Thousand tons)			
Michigan	242	362	53	D	D
Wisconsin	504	352	270	151	4
Minnesota	D	162	278	D	D
Lake States	D	876	601	D	D
Ohio	96	424	8	10	99
Indiana	4[a]	21[b]	D	-	D
Illinios	18[a]	25[b]	27	D	60
Iowa	-	-	-	D	-
Missouri	-	-	D	-	D
Kansas	D	-	-	-	-
Central States	D	446	37	D	D
North Central	1,005	1,322	638	442	375

D Withheld.

[a]Excludes withheld unbleached sulfite volume.

[b]Excludes withheld semibleached sulfate volume.

Source: U. S. Bureau of the Census. U. S. Census of Manufactures: 1958, Pulp, paper, and board, Industry Report MC58(2)-26A, 1961.

This is evident from the following tabulation taken from the 1958 Census of Manufactures:

	Production	Consumption	Net imports
	(Thousand tons)		
East North Central			
Michigan	390	797	407
Wisconsin	1,181	1,282	101
Ohio	120	638	518
Indiana, Illinois	126	183	57
West North Central	528	861	333

Long-Term Growth

The long-term trend in the region's paper and board production has been distinctly upward (Table 6). Output increased from 4.3 million tons in 1929 to 8.0 million tons in 1961. The trend of increase is apparent throughout the region, although it is most pronounced in the Lake States.

Despite a nearly two-fold increase in output, the relative importance of the region as a paper-producing area has declined. North Central paper and board output accounted for nearly 40 percent of national production in the early 1930's. The percentage dropped to 31 at the end of World War II and down to less than 25 by 1961.

The Wood Pulp Industry

The wood pulp industry is composed of that segment of the pulp and paper industry which manufactures wood pulp from pulpwood. Wood pulp may or may not be the principal product of firms within the industry.

Table 6.--North Central paper and board production by state, selected years

State	1929	1935	1945	1955	1961
	(Thousand tons)				
Michigan	1,092	1,045	1,228	1,754	1,828
Wisconsin	886	792	1,237	1,939	2,252
Minnesota	318	237	556	833	850
Lake States	2,296	2,074	3,021	4,526	4,930
Ohio	937	837	1,206	1,557	1,679
Indiana	349	247	324	301	364
Illinois	597	488	669	880	828
Iowa) Missouri) Kansas)	109[a]	D	189[a]	194	188
Central States	1,992	D	2,388	2,932	3,059
North Central	4,261	D	5,409	7,458	7,989

D Withheld.

[a]Includes Colorado.

Source: Data for 1924 - 1955 from American Paper and Pulp Association, The statistics of paper--1960, 1961. Data for 1961 from U.S. Bureau of the Census, Pulp, paper and board, Current Industrial Reports Series M26A(61)-13.

The North Central region's wood pulp industry is dominated by integrated firms which produce and consume wood pulp in the manufacture of paper and board at the pulp mill site. In total, there are 71 pulp manufacturers within the region. Only 11 of these establishments produce market pulp as a principal product. By state, 5 of these firms are located in Illinois, 4 in Wisconsin, and 1 each in Ohio and Iowa (Lockwood, 1961).

Wood pulp is manufactured from pulpwood by some type of chemical or mechanical reduction of pulpwood into individual wood fibers. The process or processes utilized by a pulp manufacturer depends upon a number of interrelated factors including the physical and mechanical characteristics of economically available pulpwood species and the nature of the final product to be produced. The number and types of pulp mills located within the region are shown in Table 7.

Pulp producers generally operate only one type of pulp mill. Nine integrated Lake States establishments, however, produce more than one type of pulp--6 plants produce two types of pulp and 3 plants produce three types of wood pulp. Mills producing more than one type of pulp (1) mix pulps for use in the manufacture of a given type of paper product, (2) produce two or more products each of which requires a different type of pulp or (3) produce and consume one type of pulp and sell another type to other firms.

Each of the nine plants operating more than one mill produces sulfite pulp, the most adaptable of the commercial pulps. Sulfite pulp is used in the production of certain grades of book, wrapping, bond and tissue papers.

Table 7.--Number of wood pulp mills in the North Central region by state and pulping process, 1961

State	Chemical pulps			Semi-chemical	Ground wood	Miscel-laneous[a]	Total	
	Sulfite	Sulfate	Soda				Mills	Plants
Michigan	2	2	-	4	4	2	14	13
Wisconsin	15	3	-	4	13	1	36	29
Minnesota	2	2	1	1	4	3	13	9
Lake States	19	7	1	9	21	6	63	51
Ohio	-	-	1	2	-	3	6	6
Indiana	-	-	-	2	-	-	2	2
Illinois	-	-	-	2	1	5	8	8
Iowa	-	-	-	2	-	1	3	3
Missouri	-	-	-	-	-	1	1	1
Central States	-	-	1	8	1	10	20	20
North Central	19	7	2	17	22	16	83	71

[a]Includes defibrated and exploded.

Source: U. S. Forest Service. Woodpulp mills in the United States, Division of Forest Economics Research, Washington, D. C. 1961.

Most plants operating more than one mill also produce groundwood pulp. As a relatively weak pulp, groundwood is usually mixed with the stronger sulfite pulp before being utilized in the paper-making process.

Roughly one-half of the region's mills produce sulfite or groundwood pulp. The relatively exacting species requirements of these pulping processes is reflected by the geographic location of these mills. Sulfite and groundwood mills in the North Central region are almost exclusively confined to the Lake States (Table 7). Long-fibered, low-resin-content species such as spruce and balsam are required for these processes. Various pines and hardwoods are also utilized in the production of sulfite and groundwood pulp but generally in small amounts in comparison to spruce and balsam.

The sulfate process can be used with many species, but it is particularly suited to the pulping of highly resinous softwoods, mainly pines. All seven of the region's sulfate mills are located in the Lake States pine areas. Soda and semichemical processes are used principally for the pulping of hardwoods. Since hardwood species are widespread, soda and semichemical pulp mills are scattered throughout the region.

Sixteen of the region's pulp mills produce defibrated, exploded or other types of wood pulp. For the most part, these processes are used in the production of coarse-fibered pulps composed of a mixture of single wood fibers and bundles of fibers. These miscellaneous pulping processes are generally applicable to most softwoods and hardwoods. The resulting pulps are used to produce such products as hardboard, insulating board, roofing felts, linoleum felts and similar paper products.

Regional pulping capacity increased from 3,425 tons in 1920 to 10,130 tons in 1961 (Table 8). Expansion has come about through increase in the size of mills. While the number of mills has remained essentially static over the past 40 years, average mill capacity increased from 40 tons per day in 1920 to 122 tons in 1961.

Despite the large increase in absolute pulping capacity, the relative importance of the North Central wood pulp industry has declined. Wood-pulping capacity has increased at a much faster pace in the South and West. In relation to total United States capacity, the North Central region declined from a high of 27 percent in 1920 to its present level of 11 percent. Over this same time period, Western mill capacity increased from 7 to 18 percent of the national total; and in the South, pulping capacity increased from 7 to 56 percent of the national total.

By process, the North Central region accounted for the following percentages of national wood pulp capacity: sulfite, 20 percent; sulfate, 2 percent; groundwood, 15 percent; soda, 24 percent; semichemical, 29 percent; and miscellaneous, 28 percent.

North Central wood pulp production, both in absolute amount and as a percentage of national output, has exhibited trends similar to those shown previously for pulping capacity. Regional output of wood pulp, which averaged some one million tons annually during the 1930's, moved up to nearly 3 million tons by 1961 (Fig. 2). Despite this large absolute gain, the relative importance of the region as a wood pulping center has declined. In the 1930's, the North Central region produced some 30 percent of the national total of wood pulp. By 1961, regional output dropped down to 11 percent of the national total.

Table 8.--Number and capacity of wood pulp mills in the North Central region, selected years

Year	North Central		North Central as a percent of U. S.	
	Mills	24-hour capacity	Mills	24-hour capacity
	(No.)	(Tons)		
1920	86	3,425	27	22
1925	86	4,720	26	26
1930	76	4,650	25	22
1934	70	4,875	24	21
1940	61	4,655	24	16
1945	57	4,870	23	14
1950	60	5,610	23	13
1952	73	6,615	24	13
1955	75	7,495	23	12
1956	81	7,295	24	11
1959	88	9,870	24	12
1961	83	10,130	23	11

Source: U. S. Forest Service. Wood pulp mills in the United States, Division of Forest Economics Research, Washington, D. C., 1961.

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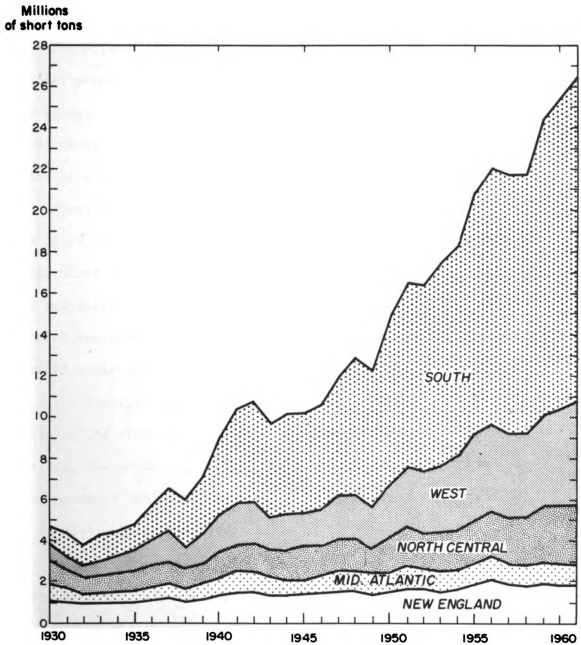


Fig. 2. Wood pulp production in the United States, by region, 1930-1961. (Source: United States Pulp Producers Association, based on data from U.S. Bureau of the Census.)

CHAPTER IV

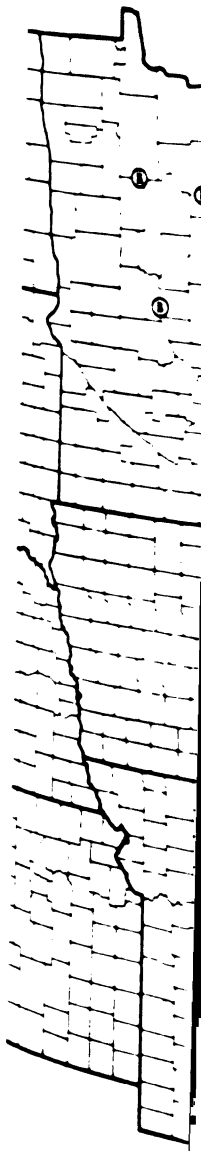
PRIMARY MANUFACTURERS

The attempt was made in this study to sample all primary manufacturers purchasing significant amounts of pulpwood in the delineated study areas. Only a few firms in Minnesota, Illinois, and Ohio failed to cooperate. The sample that was obtained accounted for a major portion of the pulpwood consumption in the region.

Forty-seven establishments consuming pulpwood were sampled. These mills, owned by 36 companies, represent 66 percent of the primary manufacturers within the North Central region. The locations of sampled mills and their respective size classes in terms of 1959 pulpwood purchases are shown in Figure 3. State samples of pulp mills and the volume of their 1959 pulpwood consumption are tabulated in Table 9.

The Michigan sample included all Lower Peninsula mills actively engaged in the production of wood pulp or other products from pulpwood. Two mills, one producing particle board and the other wood excelsior, do not purchase "pulpwood" per se. Although neither of these firms produce wood pulp in the strict sense of the word, raw wood requirements and wood procurement policies are nearly identical to those of sampled Michigan pulp and paper companies.

The Wisconsin sample represented 86 percent of the active pulpwood consumers within this state and 96 percent of the total 1959 Wisconsin pulpwood consumption. The six mills sampled in Minnesota accounted for 58 percent of the total 1959 Minnesota pulpwood consumption.



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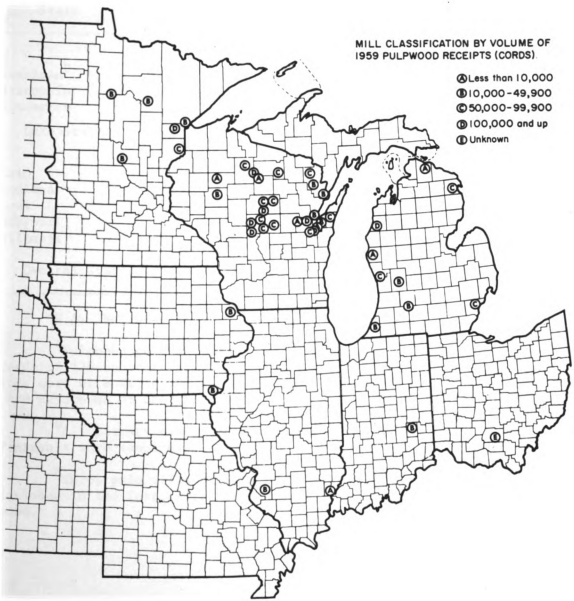

Fig. 3. Location of sampled wood pulp mills in the North Central region.

Table 9.--Number of primary manufacturers sampled and their pulpwood consumption, by state, 1959

State	Pulp mills		Pulpwood consumption	
	Number in sample	Sample as % of state total	Volume in sample (M cords)[a]	Sample as % of state total
Michigan[b]	9	60	549	79
Wisconsin	25	86	1804	96
Minnesota	6	67	419	58
Lake States	40	76	2772	82
Ohio	1	20	N.A.	N.A.
Indiana	1	100	)	
Iowa	2	67	) 89	100[c]
Missouri	1	100	)	
Illinois	2	25	23	25
Central States	7	35		

N.A. Not available.

[a]Pulpwood consumption data are reported in unpeeled standard cords of 128 cubic feet. One standard cord is equivalent to 0.8 of a long cord or unit, 4,500 pounds of soft hardwoods, and 5,000 pounds of hard hardwoods or conifers.

[b]All primary manufacturers of pulpwood in Michigan's Lower Peninsula were sampled.

[c]Three pulp mills were in operation in Iowa in 1959. The mill not included in the Iowa sample purchased only a negligible quantity of pulpwood.

Seven mills were sampled in the Central States--one each in Indiana, Missouri and Ohio and two each in Illinois and Iowa. The Missouri plant obtains nearly all of its wood supply from the Kansas study area. Sampled Indiana, Iowa and Missouri mills purchase all of the pulpwood consumed within these states.

In some respects, the Central States pulpwood industry is quite similar to the Lake States industry. Most of the region's pulp mills are well established, horizontally and vertically integrated manufacturers of paper or paperboard. The typical pulpwood consuming firm has been producing paper and board products at its present location since 1920. Plants are generally owned by a corporation that operates a number of wood consuming plants in various sections of the country. Aside from these common demographic and ownership patterns, however, Central States mills are quite dissimilar to Lake States Mills. Major differences occur in the nature of final products produced, historical dependence upon wood pulp as a basic raw material, volume and species of pulpwood species consumed, landownership and agent source of wood supply, and wood procurement methods and policies.

Primary Products

By comparing final products of sampled firms (Table 10) with products of the regional population of paper and board mills (Table 2), it can be seen that the sampled firms may be considered fairly representative of the total regional industry. Sampled Central States plants specialize in the production of board products. Sampled Lake States mills are mainly producers of paper products.

Table 10.--Principal products produced by sampled manufacturers, 1959

Product	Michigan	Wisconsin	Minnesota	Central States
	(Number of firms)			
Pulp and excelsior	1	4		1
Papers				
Fine paper		2	1	
Tissue	2	5	1	
Book paper	1			
Other papers	1	12	2	
Paperboard and building board[a]				
Container board	2	1		2
Other paperboard		1	2	
Building paper				3
Building board[b]	2			1
Total	9	25	6	7

[a]Includes corrugated medium.

[b]Includes particle board.

All but one of the Central States plants sampled, an Iowa firm, produce only one type of product. Board mills in the Lake States usually produce only one type of board also, but Lake States paper mills usually produce more than one grade of paper. In fact, sampled Lake States paper mills commonly produce as many as 4 or 5 distinct grades of paper.

Historical Dependence Upon Wood Pulp

The Lake States pulp and paper industry has been dependent upon wood pulp as its basic raw material since the early 1900's (APPA, 1961). Although sample data show that Central States paper and board mills have been in operation for approximately the same length of time as Lake States mills, locally produced pulpwood did not become an important source of raw materials for these mills until the early 1950's (Mendel, 1962). These mills either utilized fibrous materials other than wood as a basic raw material or purchased wood pulp or pulpwood from other sections of the country. Less than 100,000 cords of pulpwood were produced annually within the Central States prior to 1950.

Pulpwood production in the Central States as a whole has increased rapidly since the early 1950's (Figure 4). In 1952, slightly over 100,000 cords of pulpwood were produced from Central States forests. By 1961, production had increased to well over 400,000 cords, with most of this increase in output occurring since 1957. Despite a three-fold increase in local production, local producers have not been able to supply pulpwood consumers with sufficient quantities of desired pulpwood species.

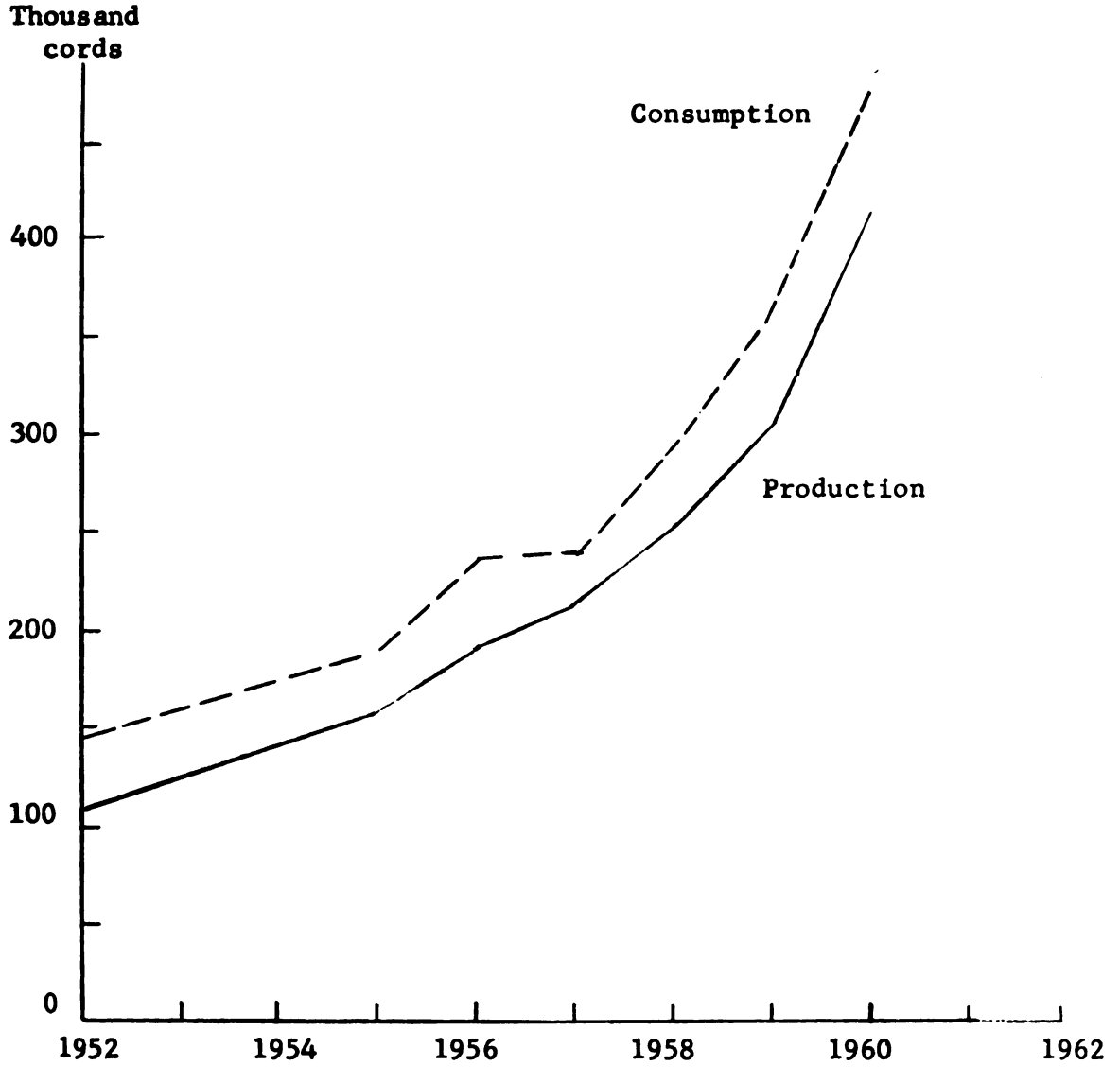

Fig. 4. Pulpwood production and receipts in the Central States, 1952-1961. (Source: Central States Forest Experiment Station, U.S. Forest Service, Columbus, Ohio 1952 data from Misc. Release 13. 1955-1961 data from Tech. Paper 188.)

Net imports[3] of pulpwood averaged about 50,000 cords annually from 1956 to 1961. Most imports of pulpwood into the Central States come from Wisconsin and are destined for mills in Illinois (Mendel, 1962).

The trends in Central States pulpwood production by states are shown in Figure 5. Production increased steadily in this area from 107,000 cords in 1952 to 456,000 cords in 1961. The upward trend is mainly a result of increased production in Ohio, and secondarily, in Indiana and Illinois. Iowa and Missouri production trends are virtually horizontal.

Lake States pulpwood production and consumption trends are shown in Figure 6. The long-term trends have been upward but yearly variations clearly reflect the influence of market conditions for paper and board products. Immediately following World War II, both production and consumption of pulpwood declined. They increased sharply during the Korean War, then decreased as the demand for paper and board declined at the end of the war in 1953. Subsequent production and consumption activity continued to reflect the trend in aggregate economic activity by expanding from 1953 to 1956 and declining during the 1957-1958 recession.

Lake States mills have been relying more heavily upon locally produced pulpwood in recent years. In 1951, imports into the region reached 980,000 cords, 38 percent of total consumption. By 1961,

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[3]Net imports represent the difference between total imports and exports. Only very minor amounts of pulpwood are exported by Central States producers. From 1955 through 1960, 13,000 cords of pulpwood were exported, 80 percent of which was produced in Ohio.

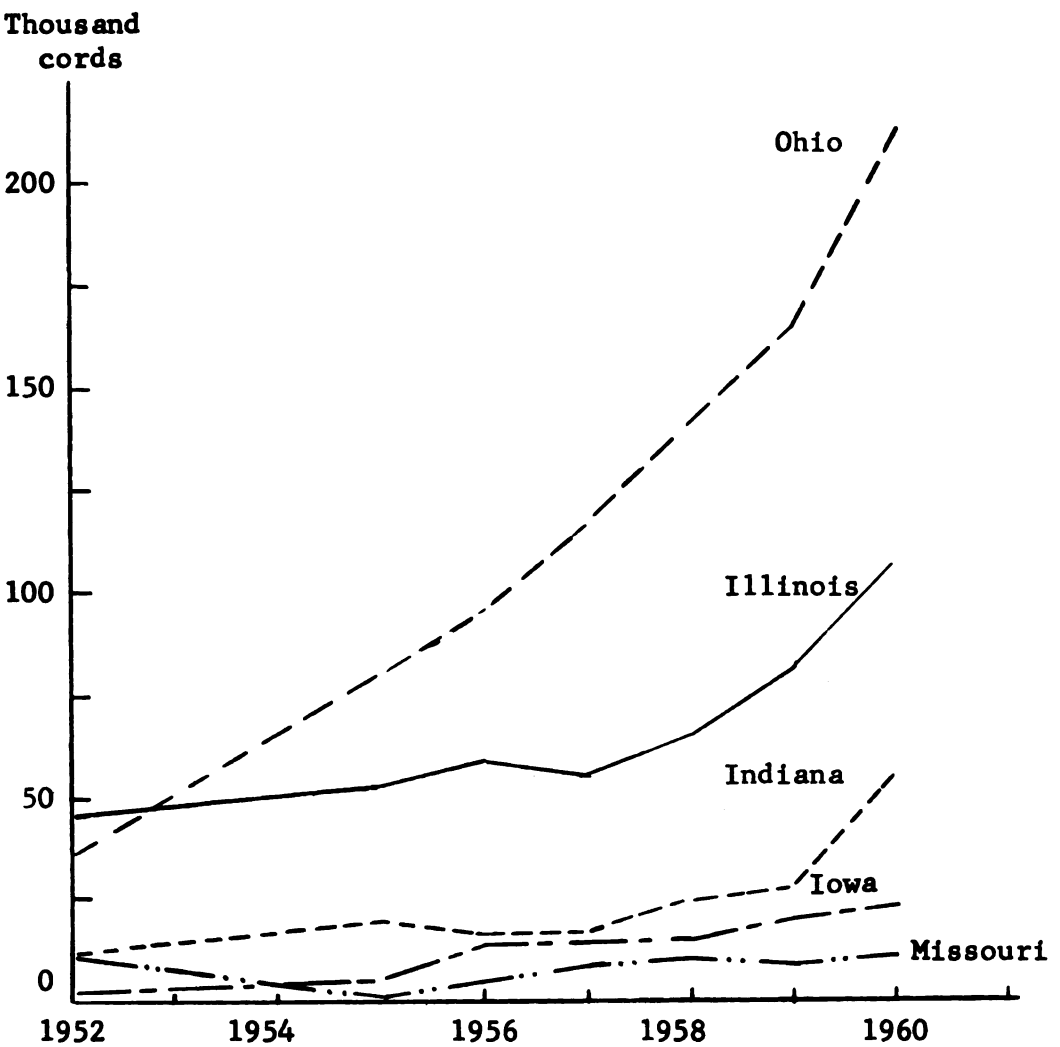

Fig. 5. Pulpwood production in the Central States, by state, 1952-1961. (Source: Central States Forest Experiment Station, U. S. Forest Service, Columbus, Ohio. 1952 data from Misc. Release 13. 1955-1961 data from Tech. Paper 188.)

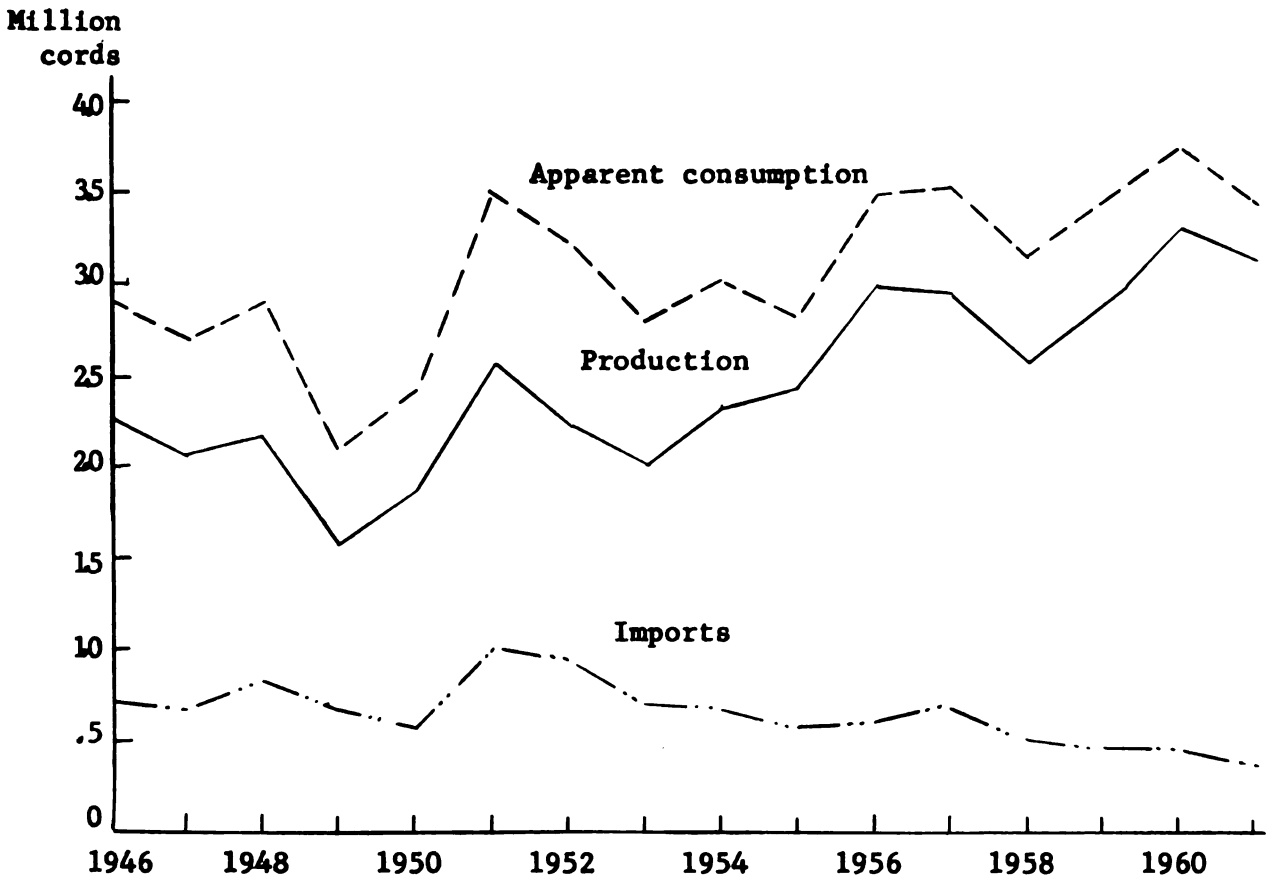

Fig. 6. Pulpwood production, imports and apparent consumption in the Lake States, 1946-1961. (Source: Lake States Forest Experiment Station, U. S. Forest Service, St. Paul, Minn., Tech. Note series.)

imports had declined to one-third of their 1951 peak and accounted for only 10 percent of consumption.

Figure 7, which traces production, imports, exports, and apparent consumption for Wisconsin, shows a horizontal trend in consumption and a rising trend of production. Imports, which totaled 1.6 million cords in 1951, were down to 0.9 million cords in 1961. The curtailment was sharpest in the more distant Canadian imports, less so in imports from Michigan's Upper Peninsula. For practical purposes, much of the Upper Peninsula supply area can be considered local to Wisconsin pulp mills.

Figure 8 illustrates the pronounced upward trend in Michigan pulpwood production in response to increased consumption by pulp mills in the state and declining imports (largely spruce and fir from Canada). Exports, nearly all from the Upper Peninsula to Wisconsin, are an important segment of Michigan production. Since the Upper Peninsula is actually part of the local supply area to Wisconsin mills, exports from Michigan have shown a great deal of stability.

Minnesota's production shows an essentially horizontal trend in the face of a slight rise in consumption (Figure 9). This reflects a decline of exports (mainly to Wisconsin) rather than an increase in imports. The volume of imports (mainly from Canada) has moved downward fairly consistently since 1951.

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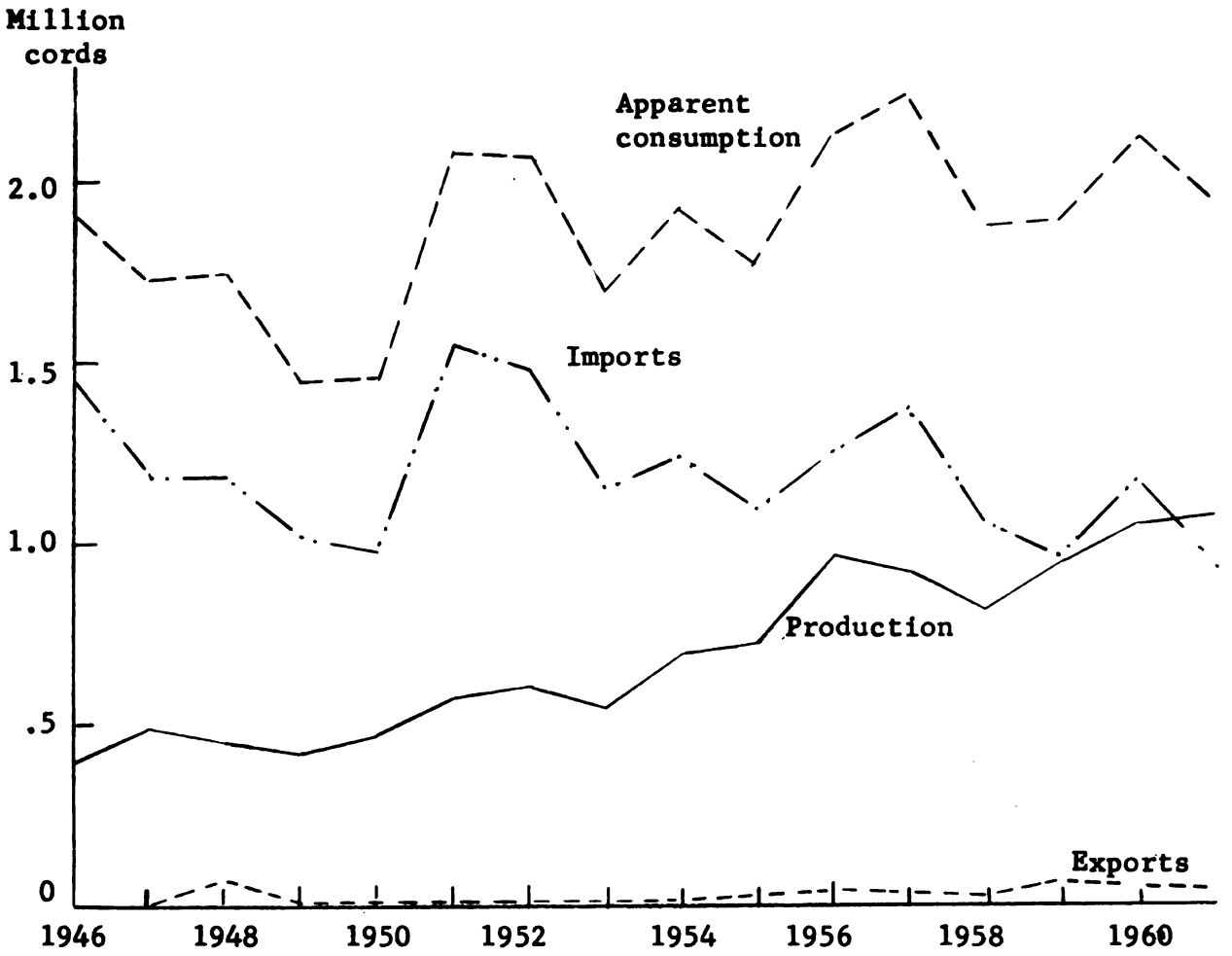

Fig. 7. Pulpwood production, imports, exports, and apparent consumption in Wisconsin, 1946-1961. (Source: Lake States Forest Experiment Station, U. S. Forest Service, St. Paul, Minn., Tech. Note series.)

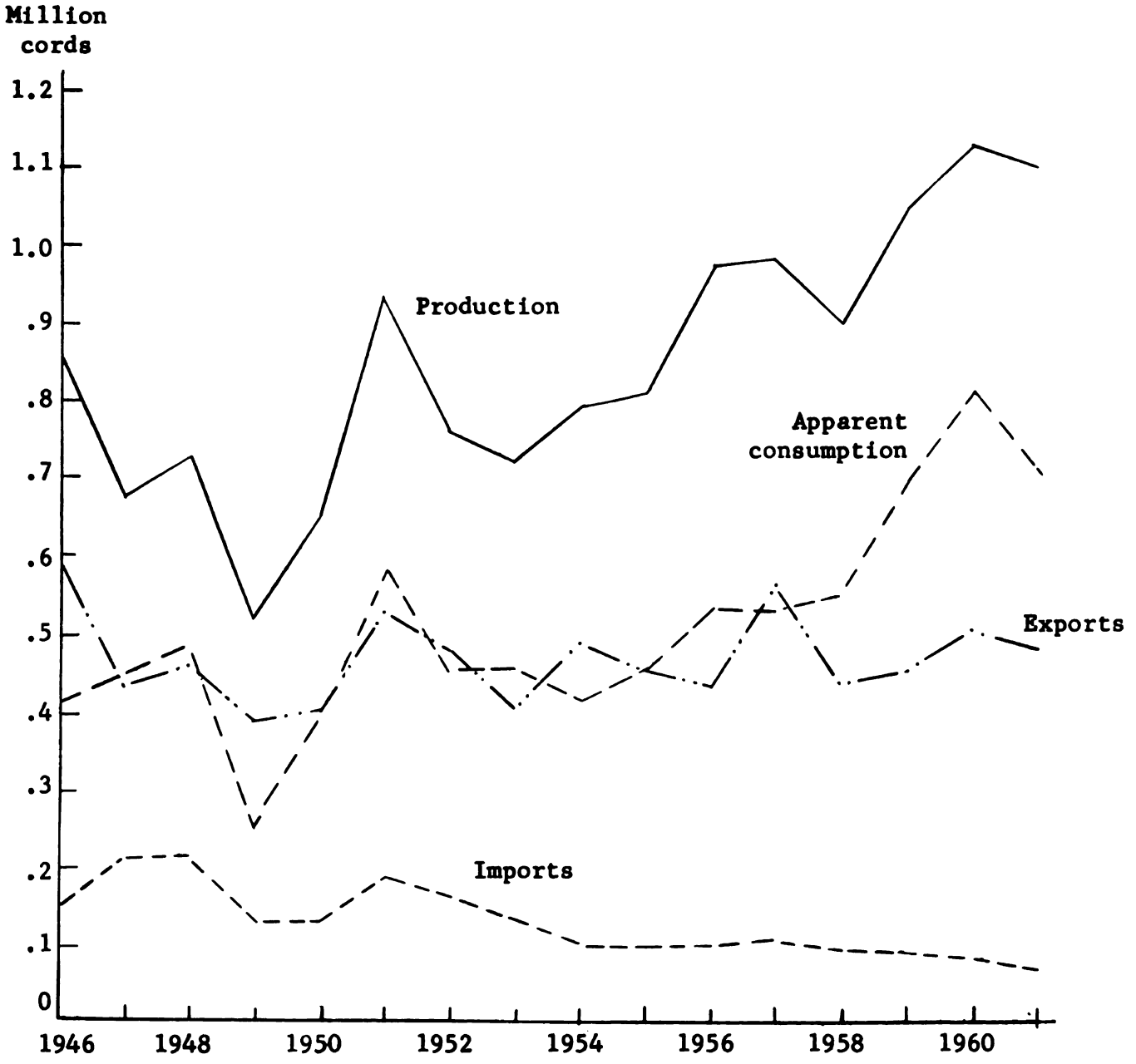

Fig. 8. Pulpwood production, imports, exports, and apparent consumption in Michigan, 1946-1961. (Source: Lake States Forest Experiment Station, U. S. Forest Service, St. Paul, Minn., Tech. Note series.)

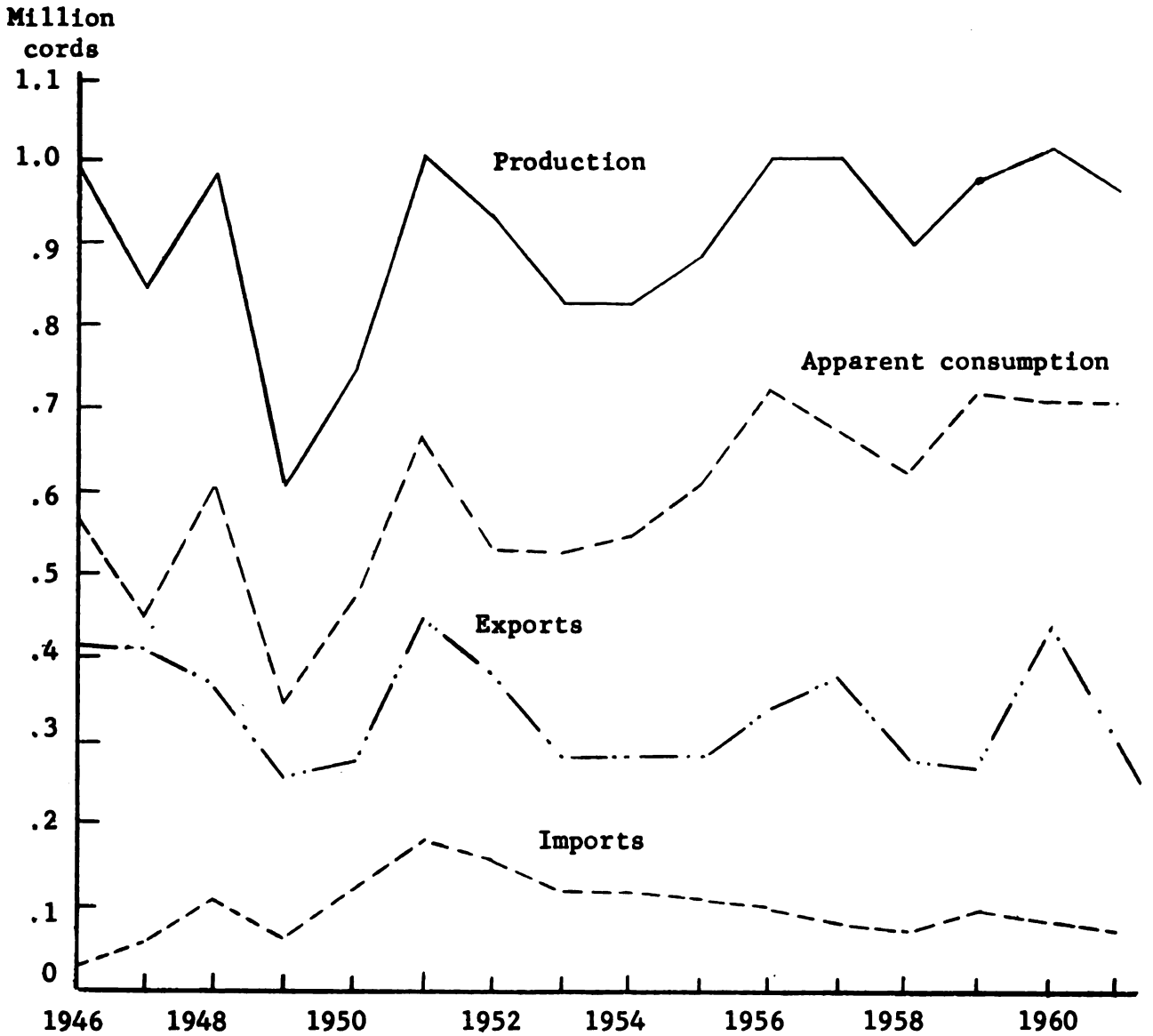

Fig. 9. Pulpwood production, imports, exports, and apparent consumption in Minnesota, 1946-1961. (Source: Lake States Forest Experiment Station, U. S. Forest Service, St. Paul, Minn., Tech. Note series.)

Pulpwood Consumption

Sampled pulp mills vary greatly in size (Table 11). The range is relatively narrow in the Central States (none of the mills sampled consumed as much as 50,000 cords of pulpwood in 1959), but in the Lake States, mill consumption ranges from less than 10,000 cords to several hundred thousand cords. Average consumption in 1959 was 19,000 cords in the Central States, 66,000 cords in the Lake States.

Pulpwood consumption in the Central States is predominantly (over 90 percent) of hardwood species such as maple, oak, beech, aspen, and cottonwood. Hardwoods predominate in Central States forests, and the pulp industry in this area has had to adapt itself to the species available.

In the Lake States, species consumption is more variable (Table 12). Hardwood species (mainly aspen) comprised 63 percent of the pulpwood consumed in Michigan in 1959, 58 percent in Minnesota, and 43 percent in Wisconsin. Softwoods used are mainly spruce, fir, and pine.

Small mills in the Lake States tend to rely more on hardwoods species than the larger mills which reach out into wider procurement territories, generally operate more than one type of mill, and produce a variety of paper products. Some 85 percent of the pulpwood consumed in 1959 by mills using less than 10,000 cords was aspen. In the size class 10,000 - 50,000 cords, hardwoods comprised 60 percent of total wood consumption. Larger mills used more softwood than hardwood.

Table 11.--Distribution of sampled mills by size class of mill and study area, 1959

Study area	Thousands of cords purchased				Total sample
	Less than 10,000	10,000-50,000	50,000 100,000	More than 100,000	
	(Number of mills)				
Michigan	2	3	3	1	9
Wisconsin	4	4	10	7	25
Minnesota		4	1	1	6
Lake States	6	11	14	9	40
Ohio[a]					1
Indiana		1			1
Illinois	1	1			2
Iowa		2			2
Missouri	1				1
Central States	2	4			7
North Central region	8	15	14	9	47

[a]Data not reported by mill.

Table 12.--Pulpwood species received at sampled Lake States mills, by study area, 1959

Species	Peeled	Rough	All Pulpwood
		(Thousand cords)	
		MICHIGAN	
Aspen-Birch	102.1	205.0	307.1
Mixed hardwoods	1.8	27.5	29.3
Spruce-Fir	78.8	-	78.8
Pine	10.4	109.9	120.3
Total	193.1	342.4	535.5
		WISCONSIN	
Aspen-Birch	348.4	214.7	563.1
Mixed hardwoods	9.4	158.2	167.6
Spruce-Fir	146.2	323.6	469.8
Pine	37.9	319.0	356.9
Hemlock	14.9	67.2	82.1
Tamarack	1.0	15.5	16.5
Other[a]		48.6	48.6
Total	557.8	1,146.8	1,704.6
		MINNESOTA	
Aspen-Birch	160.5	67.7	228.2
Spruce-Fir	14.0	62.8	76.8
Pine	9.0	58.5	67.5
Other[b]		18.5	18.5
Total	183.5	207.5	391.0

[a]Includes ponderosa and lodgepole pine.

[b]Species not specified.

The use of hardwood species in the Lake States has increased rapidly in recent years (Table 13). In 1946, hardwoods comprised 25 percent of pulpwood consumption at Lake States mills. By 1961, the percentage of hardwoods increased to 54. Aspen is the principal pulpwood species among hardwoods by far, although the rate of increase in the use of other hardwoods is more spectacular. All but two of the Lake States pulp mills used aspen in 1959. The movement from softwoods to hardwoods has been fostered by changes in pulp and paper technology which have made it increasingly feasible to shift from relatively scarce softwoods (particularly spruce and fir) to less expensive, locally plentiful hardwoods.

Wood Supply Areas and Methods of Transportation

The size, shape and location of the sampled pulp companies' timbersheds are quite variable, but fairly definite regional patterns are evident.

Central States mills draw their wood supplies from relatively small, localized timbersheds which tend to assume an irregular, circular form about the mill. Wood is drawn from an average distance ranging from 20 to 100 miles, depending primarily upon the volume of wood consumed.

Lake States mills draw their wood supplies from considerably larger timbersheds, the nuclei of which may be located hundreds of miles from the pulp mill sites. Sampled Minnesota mills reach out an average distance of 108 miles for their wood supplies. Michigan mills reach out an average distance of 236 miles; and Wisconsin mills, 475 miles.

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Table 13.--Pulpwood consumption (receipts) at Lake States mills, by species groups, 1946-1961

Species	1946	1950	1955	1959	1961
			(Thousand cords)		
Softwoods:					
Spruce-Fir	1,299	989	1,058	875	856
Pine	558	487	517	748	626
Hemlock-Tamarack	338	135	106	108	111
Total	2,195	1,611	1,681	1,731	1,593
Hardwoods:					
Aspen-Birch	705	752	1,155	1,390	1,517
Other hardwoods	22	60	147	289	373
Total	727	812	1,302	1,679	1,890
All species	2,922	2,423	2,983	3,410	3,483

Source: Lake States Forest Experiment Station. Technical Note series, U. S. Forest Service, St. Paul, Minn.

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Truck and rail are the principal means of transporting pulpwood from wood supply areas to pulp mills. In the Central States study areas, transportation distances are generally too short for economical rail transport. Only one mill, a Missouri firm, purchases rail-hauled wood. The highest average truck haul distance in 1959 reported by a Central States mill was 50 miles. Maximum truck hauls seldom exceed 100 miles.

Rail transportation is widely used in the Lake States (Table 14). Fifty-nine percent of the pulpwood purchased by sampled mills is moved to the mill by rail, 38 percent by truck and 4 percent by water. One-half of the mills sampled in Michigan, 95 percent of those sampled in Wisconsin, and two-thirds of the mills sampled in the Minnesota study area receive at least some rail deliveries.

Table 14.--Mode of transportation by which pulpwood was delivered to sampled Lake States mills, 1959

Study area	Truck	Railroad	Water	Total
	(Percent of volume)			
Michigan	66	23	10	100
Wisconsin	24	73	3	100
Minnesota	56	44		100
Lake States	38	59	4	100

Although truck transport is generally used for short hauls and rail for long hauls, there is no single point or mileage zone below which it is more economical to transport wood by truck and above which it is more economical to transport by rail. The break-even point is highly variable, depending on such factors as specific mill locations,

highways and rail loading points available, specific railroads and numbers of carriers involved, and bargaining abilities of those involved in rate negotiations (James and Lewis, 1960). Generally, rail haul is not used for distances of less than 100 miles. Truck haul is used for shorter distances, although in some cases (particularly in Lower Michigan), truck hauls may extend beyond 200 miles. Average truck-haul distances reported by Lake States mills in 1959 range from 12 to 160 miles--the average is 28 miles in the Minnesota study area, 33 miles in Wisconsin, and 71 miles in Michigan.

Locations of pulp mills and pulpwood production in the Central States are shown in Figure 10. The close relationship between mills and their procurement territories is evident here. Central States mills consume hardwoods which are widespread and abundant in relation to a small number of mills of limited size. Mills sampled in this area obtain a major part of their wood supplies within a radius of 45 miles.

Figure 11 shows the location of pulp mills and pulpwood production in the Lake States. There is some geographical correspondence between pulp mill location and the location of pulpwood production, but it is evident that the relationship is not as close as it is in the Central States. The situation is at least partially clarified by reference to maps showing the locations of mills using a particular major species and the location of pulpwood production in the same species. Such maps have been developed for aspen (Figure 12), pine (Figure 13), and spruce-fir (Figure 14).

In Figure 12, it can be seen that there is some correspondence between aspen pulpwood production in the Lake States and the locations

PRODUCTION CLASSIFICATION IN TERMS OF CORDS PER COUNTY

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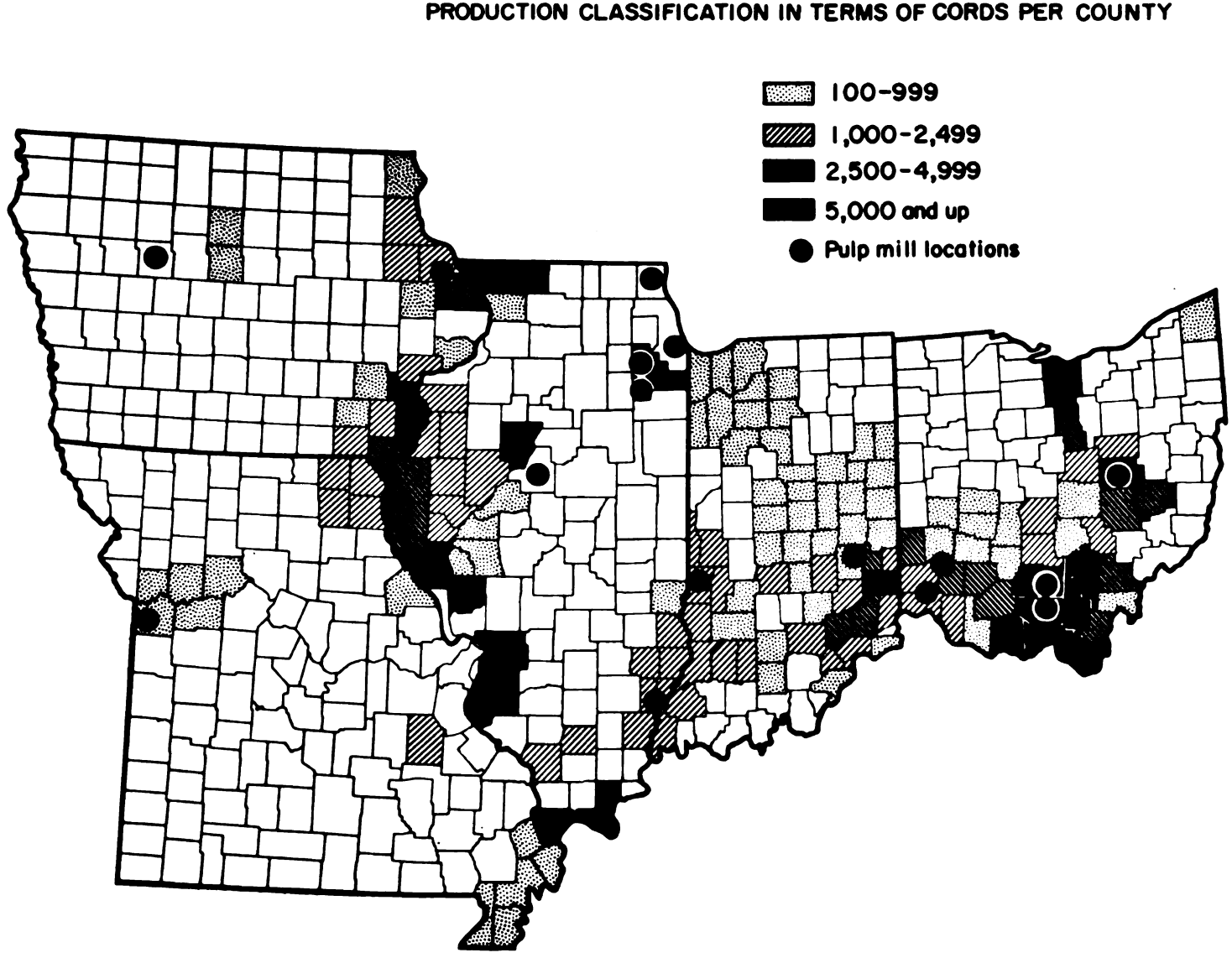
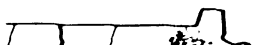


Fig. 10. Location of pulp mills and production of pulpwood of all species in five Central States by county, 1960. (Source: Mill locations from Lockwood's Directory of the Paper and Allied Trades, 1960. Pulpwood production from Central States Forest Experiment Station, Pulpwood Production and Consumption in the Central States, 1960, Tech. Paper 182, Columbus, Ohio, 1961.)



MILL CLASSIFICATION BY VOLUME OF
1959 PULPWOOD RECEIPTS (CORDS)

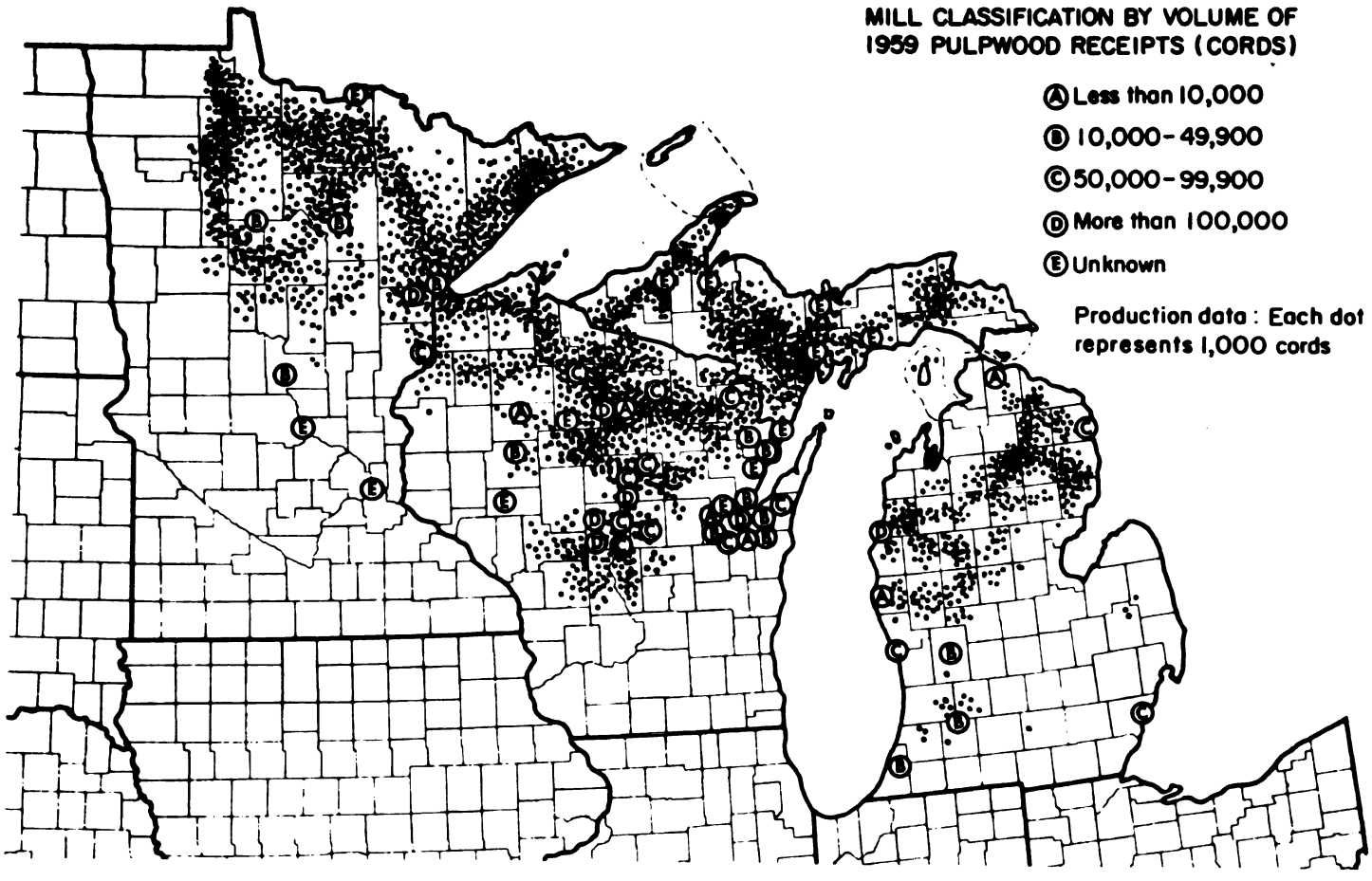
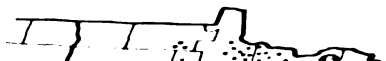


Fig. 11. Locations of pulp mills and production of pulpwood of all species in the Lake States by county, 1959. (Source: Mill locations from Lockwood's Directory of the Paper and Allied Trades, 1960; and other sources. Pulpwood production from Lake States Forest Experiment Station, Pulpwood Production in Lake States Counties, 1959, Station Paper No. 85, St. Paul, Minn., 1960.)



MILL CLASSIFICATION BY VOLUME OF 1959
ASPEN PULPWOOD RECEIPTS (CORDS)

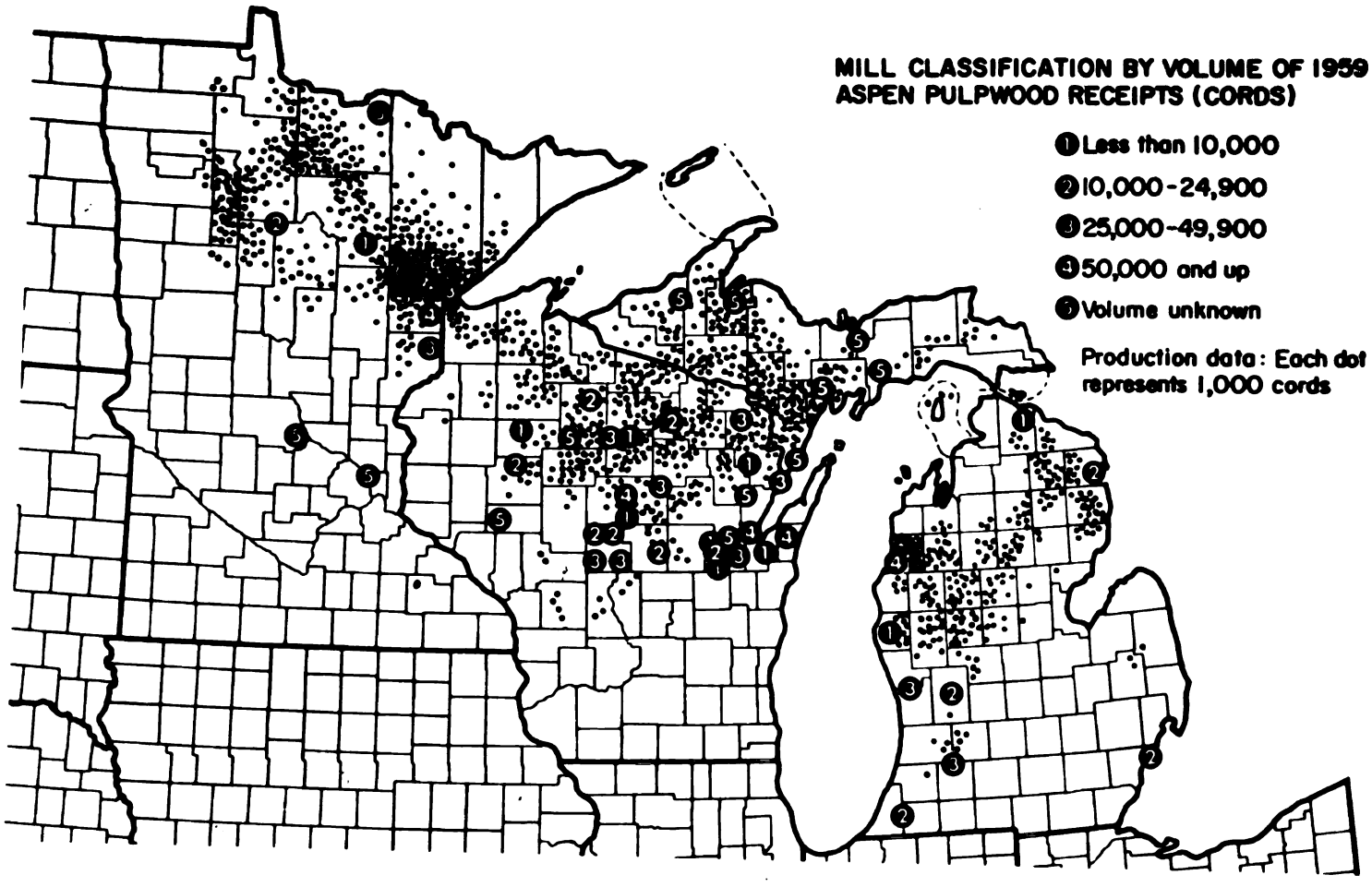
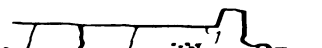


Fig. 12. Locations of pulp mills using aspen and production of aspen pulpwood in the Lake States by county, 1959. (Source: Mills using aspen determined by questionnaire and correspondence. Aspen pulpwood production from Lake States Forest Experiment Station, Pulpwood production in Lake States Counties, 1959, Station Paper No. 85, St. Paul, Minn., 1960.)



MILL CLASSIFICATION BY VOLUME OF 1959
PINE PULPWOOD RECEIPTS (CORDS)

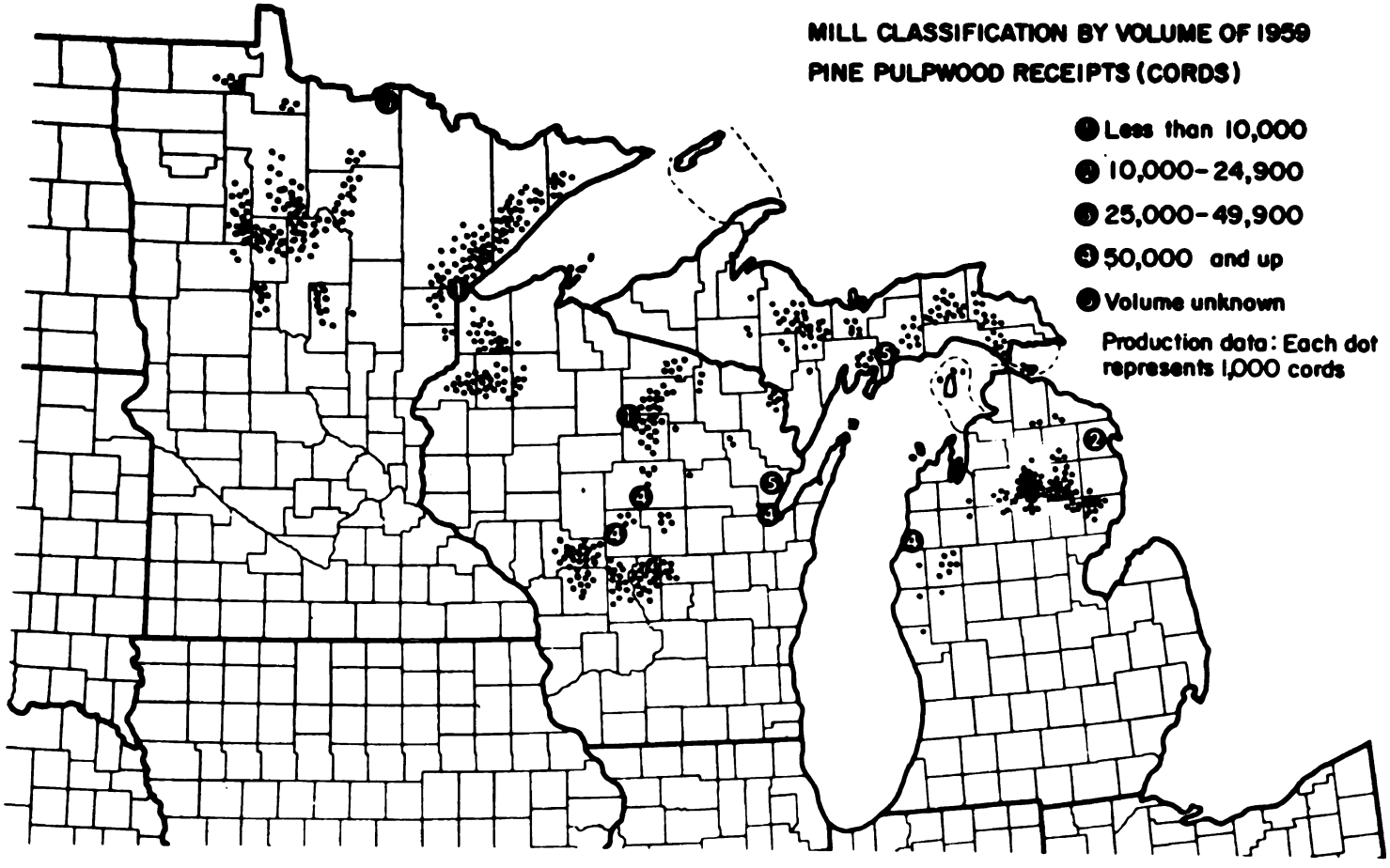


Fig. 13. Locations of pulp mills using pine and production of pine pulpwood in the Lake States by county, 1959. (Source: Mills using pine determined by questionnaire and correspondence. Pine pulpwood production from Lake States Forest Experiment Station, Pulpwood Production in Lake States Counties, 1959, Station Paper No. 85, St. Paul, Minn., 1960.)

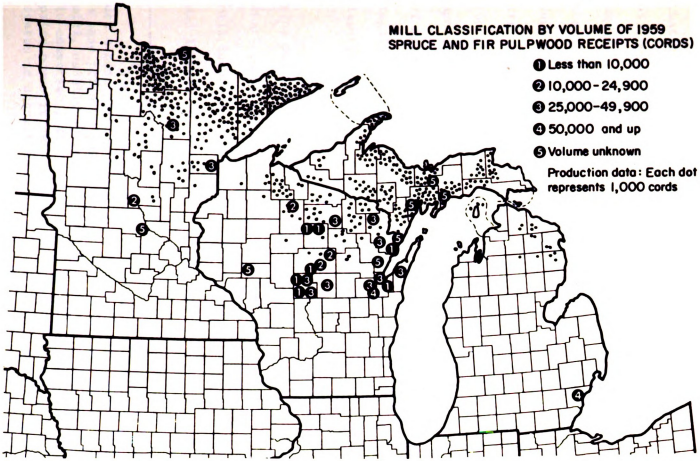


Fig. 14. Locations of pulp mills using spruce and balsam fir and production of spruce and fir pulpwood in the Lake States by county, 1959. (Source: Mills using spruce and fir determined by questionnaire and correspondence. Spruce and fir pulpwood production from Lake States Forest Experiment Station, Pulpwood Production in Lake States Counties, 1959, Station Paper No. 85, St. Paul, Minn., 1960.)

of mills using aspen pulpwood. Both mills and production are widely distributed throughout the area. In general, aspen production is most highly concentrated close to pulp mill markets, but it is also clear that a large part of the aspen output occurs at some distance from pulp mill markets. Longer hauls are necessary to Wisconsin mills, for example, because of the large clusters of mills using this species and the obvious need of wider procurement territories to insure adequate supplies to all aspen users. In Lower Michigan, mills are not concentrated in clusters, but since aspen consumption is large and has been increasing rapidly, a number of mills deliberately encourage a certain amount of long hauling to spread out the volume of cutting as a means of maintaining desirable levels of forest inventory. This kind of regulation is accomplished through a combination of policy in the issuing of wood-purchase contracts and a zone pricing system.[4]

Locations in the Lake States of mills using pine pulpwood and pine pulpwood production are shown in Figure 13. Here it can be noted that production is controlled by the location of pine stands rather than mill locations. Pine stands are not distributed throughout the region, and long hauls are frequently necessary to move pine to mill outlets.

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[4]Seven Lower Michigan mills and 8 of the sampled Wisconsin mills use a zone pricing system for truck-delivered wood. Under this system, a base price is paid for wood produced within a short distance of the mill, usually 40 to 50 miles. For longer hauls, the price is increased to compensate, at least in part, for the added costs of hauling. The price bonus is generally increased 50 cents per 50- mile zone. This system is described in more detail in the section "Prices and Costs."

Again, in Figure 14, it can be seen that much of the spruce-fir production in the Lake States is located in areas far from mills using these species. Mill users are concentrated in Wisconsin, but regional production is concentrated in Michigan's Upper Peninsula and northeast Minnesota. The production centers are controlled by the occurrence of spruce-fir forests. Most Wisconsin mills report that their supply areas for these species extend out 200 to 400 miles from the mill site and, in some cases, 1,000 miles or more into Canada or western United States. In general, the larger the quantity of spruce and fir consumed by a mill, the larger the timbershed.

Timbersheds are seen to be affected by the relationship of pulp mill location to forest location, transport access to forests and freight charges, species requirements, and size of mill. Timbersheds are also strongly affected by the extent of competition among mills for available pulpwood supplies.

Other things being equal, mills which encounter competition for the purchase of limited pulpwood supplies tend to have larger procurement territories than those encountering less competition. In this respect, mills in the Central States appear to be in a more favorable market position than those sampled in the Lake States. Mills sampled in Indiana and Missouri are the sole pulpwood buyers within these states. Other sampled Central States mills encounter little competition from other pulpwood consumers since (1) they purchase relatively small volumes of pulpwood, or (2) their timbersheds are geographically separated.

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In the Lake States no single mill possesses extensive market power in terms of pulpwood purchases. Few mills draw wood from timbersheds in which they are the sole pulpwood buyer. In addition, few mills possess extensive market power in terms of pulpwood purchases. The largest individual consumer of pulpwood sampled, a Michigan firm, consumed 42 percent of the pulpwood purchased in the Lower Peninsula in 1959. The 7 Wisconsin mills purchasing more than 100,000 cords of pulpwood accounted for 50 percent of the Wisconsin pulpwood market. It would appear, therefore, that in the absence of intermill cooperation, Central States mills enjoy a much stronger market position than most Lake States mills.

Wood Procurement Practices

Wood procurement methods and policies employed by North Central pulpwood consumers are extremely variable. Each of the sampled mills utilizes a somewhat different procurement technique. The exact procurement methods used by a mill can be visualized as a compromise between the goals of the firm as a whole, technical requirements dictated by technology in the manufacturing stages, and by market conditions faced by the firm.

Data were not collected in a manner designed to indicate the importance of these individual but related factors in the overall wood procurement policies of sampled mills. However, some tentative hypotheses regarding the influence of each of these factors upon wood procurement policies can be formulated. Data collected concerning pulpwood specifications and current inventory practices are assumed to

at least partially reflect influences of a technological nature. Landownership and agent sources of pulpwood, when coupled with wood supply areas, give an indication of the influence of various environmental conditions surrounding the individual firm. These include such factors as species availability, degree of competition encountered, and availability of an adequate woods labor force. Agent sources of pulpwood and the value placed on maintenance of continuous and adequate supplies of pulpwood give some indication of the influence of firm goals upon wood-procurement activities.

Agent Source

North Central pulp mills obtain wood supplies from three general sources: (1) mill employees or logging contractors who harvest stumpage from company owned lands or timber purchased by mills from public or private landowners; (2) independent producers; and (3) pulpwood dealers. The relative importance of these different sources varies by study area. Sampled Lake States mills obtained 26 percent of their 1959 pulpwood supplies from dealers, 57 percent from producers, and 16 percent from company logging operations or contract cutters. Central States mills purchased mainly from producers; only 14 percent of total receipts were obtained from dealers (Table 15).

Wood procurement systems employed by individual mills reflect different degrees of involvement in wood-procurement activities. Procurement systems range from complete dependence upon one type of agent source to more complex systems in which some wood is drawn from company owned lands, contract loggers, independent producers and intermediate market agents.

Table 15.--Agent source of pulpwood purchased by sampled pulp mills, 1959

Agent Source	Lake States			Central States
	Michigan	Wisconsin	Minnesota	
	(Thousand cords)			
Mill employees[a]		19.3		
Contract cutters:				
Company lands[b]		193.4	14.9	.1
Other land		159.9	48.3	
Producers	454.7	837.5	208.5	95.0
Dealers[c]	80.8	494.5	119.5	15.9
All sources	535.5	1,704.6	391.0	111.0

[a]Mill employees operating on company owned land.

[b]Includes private lands managed under long-term contracts by pulp and paper companies.

[c]Includes only those volumes delivered by suppliers whom pulp companies formally recognize as dealers.

The procurement system most frequently used by sampled mills is one in which the pulpwood marketing chain from the stump to the consumer involves only one agent--the independent producer. With the exception of Wisconsin, this system is widely used throughout the region. Six Michigan mills, 3 Wisconsin mills, 5 Minnesota mills and 5 Central States mills obtain wood supplies solely from producers. Nearly all mills purchase at least some wood from producers.

Producer contracts range in size from as few as 10 cords to several thousand cords. In aggregate, the 40 sampled Lake States mills purchased pulpwood from some 9,800 producers in 1959. Average purchases per producer amounted to 153 cords. The average number of cords per producer contract in the Central States was 210.

In contrast to the Central States, Lake States mills utilize procurement systems which are quite diverse with respect to the size of producer purchases. Sampled Michigan mills which obtain wood supplies from producers use fewer and larger producer contracts than their Minnesota and Wisconsin counterparts. The average producer purchase is 440 cords in Michigan, 142 cords in Wisconsin and 73 cords in Minnesota (Table 16). Size of mill does not appear to be correlated with the average volume obtained from suppliers.

Whenever producers are an important agent source, pulp mills generally provide these suppliers with financial aids and other services that would otherwise be provided by intermediate market agents. Financial aid in the form of advances or prepayments are regularly offered by 4 Michigan, 2 Minnesota, 9 Wisconsin and 2 Central States mills.

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Table 16.--Average number of cords per producer and dealer delivered to sampled Lake States mills, by size class of mill, 1959

Study area and mill size class	Cords per producer	Cords per dealer
	(Cords)	
Michigan		
Less than 50,000	381	5,567
More than 50,000	445	4,006
All mills	440	4,253
Wisconsin		
1,000 - 50,000	132	1,164
50,001 - 100,000	116	4,397
More than 100,000	171	2,311
All mills	142	2,300
Minnesota		
1,000 - 50,000	1,098	850
More than 50,000	50	2,080
All mills	73	1,755
Lake States		
Less than 10,000	54	1,092
10,001 - 50,000	341	1,337
50,001 - 100,000	120	4,283
More than 100,000	168	2,235
All mills	153	2,300

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Although they prefer not to make money advances as a general rule, 9 other mills, all Lake States firms, do so upon the requests of their more reliable suppliers.

The size of these loans or prepayments varies. Thirteen Lake States mills limit loans to a specific percentage of the value of a producer's contracted quota. Five mills set a maximum amount beyond which they will not lend and two mills report that the upper limit to the amount offered depends on the reputation and reliability of the producer. A loan or prepayment is generally offered to a producer only if he has harvested sufficient timber to provide adequate security for the amount of the loan involved. Loans are usually interest free.

Another form of aid frequently provided by pulp companies is in the purchase of stumpage, particularly where timber must be purchased in large blocks. Funds for the purchase may be advanced or, more commonly, a pulp company will buy the stumpage, allocate it to producers, and deduct the stumpage price from the price paid producers for delivered pulpwood.

Dealers are an important, but seldom exclusive, agent source of pulpwood. Twenty-four mills (3 in Michigan, 17 in Wisconsin, 2 in Minnesota, and 2 in the Central States) draw part of their wood supply from intermediate market agents. Only 2 firms, one each in Michigan and Wisconsin, purchase all of their wood requirements from dealers. In terms of total volume of pulpwood receipts, dealers accounted for 14 percent of Central States receipts in 1959. The corresponding figure in Michigan was 18 percent; in Wisconsin, 29 percent; and in Minnesota, 31 percent (Table 17).

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Table 17.--Agent source of wood supply delivered to Lake States pulp mills, by size class of mill, 1959

Study area and size class	Contract cutter	Producer	Dealer	All agents
		(Thousand cords)		
Michigan				
Less than 50,000		57.9	16.7	74.6
More than 50,000		396.8	64.1	460.9
Total		454.7	80.8	535.5
Wisconsin				
1,000 - 50,000	3.1	69.7	85.0	157.8
50,001 - 100,000	205.5	322.8	171.5	699.8
More than 100,000	164.0	445.0	238.0	347.0
Total	372.6	837.5	494.5	1,704.6
Minnesota				
10,001 - 50,000	32.0	68.1	15.3	115.4
More than 50,000	31.2	140.4	104.0	275.6
Total	63.2	208.5	119.3	391.0
Lake States				
Less than 10,000	.6	10.0	16.7	27.3
10,001 - 50,000	34.5	185.7	100.3	320.5
50,001 - 100,000	205.5	559.6	235.6	1,000.7
More than 100,000	195.2	745.4	342.0	1,282.6
Total	435.8	1,500.7	694.6	2,631.1

Dealer contracts may be as small as 600 or 700 cords, but they are generally much larger than producer contracts. The average Lake States dealer contract in 1959 was 2,300 cords (as compared to 153 cords per producer contract). By states, the average dealer contract was 4,253 cords in Michigan, 2,300 in Wisconsin, and 1,755 in Minnesota.

The dealer system offers pulp mills a number of advantages over other procurement methods, and for these advantages dealers receive a commission ranging from $0.50 to $1.$0 per cord over producers prices. Acting as an agent between the pulp company and the pulpwood producer, the dealer assumes responsibility for concentrating the output of large numbers of small producers and scheduling deliveries. Quotas are distributed among dealers who, in turn, distribute quotas among pulpwood producers with whom they have working relationships. By the use of dealers, pulp companies also hope to be able to partially shift the legal responsibility for insuring that pulpwood has been obtained under clear title and has been produced in compliance with labor and social security laws.

Dealers frequently relieve mills of the necessity of providing financial assistance and other aids to producers by assuming these functions themselves. The use of intermediate market agents, however, does not always remove the need to finance suppliers. Nine mills provide financial aids in the form of loans or prepayments to dealers.

A dealer's knowledge and experience with local procurement problems and conditions are also of value to pulp mills. This becomes particularly important when species requirements or other factors necessitate changes in wood procurement territories. Dealers are

generally important suppliers for companies whose timbersheds cover large areas or which are located at considerable distances from the mill.

Dealer contracts are not without their disadvantages. This is evident from the fact that many Lake States mills which once drew most of their wood supplies from dealers have eliminated dealers entirely. Other mills have substantially reduced the proportion of total wood receipts obtained from this source or eliminated marginal dealers by cutting off financial aid. Still others have continued to purchase from dealers but have either eliminated the dealer bonus or redefined dealers in terms of quantities of pulpwood supplied rather than by the nature of the marketing function performed.

The shift away from dealers to other agent sources has occurred throughout the Lake States, but it is most evident among mills with relatively large annual wood requirements. Larger mills (with annual receipts above 50,000 cords) obtained a much smaller percentage of their wood requirements from dealers in 1959 than the smaller mills. Moreover, the larger mills reported that their 1959 dealer contracts represented a significantly lower proportion of total receipts than was the case in earlier years. The small mills did not report any significant changes in agent source.

A number of factors have contributed to the declining importance of the pulpwood middleman. Some of these have been a natural outgrowth of technological changes, both in the pulp mill itself and in the wood supply sectors of the pulpwood industry. Others reflect an increasing awareness of pulp and paper companies of the benefits of closer

mill-producer relations and the need for sound forestry practices in safeguarding their future wood supplies.

The shift to the use of locally available hardwoods and the simultaneous shrinking of timbersheds has enabled many mills to adjust wood purchases away from dealers using expensive rail hauls to independent producers who truck wood directly to the mill. In addition, by using large efficient trucks on improved highway systems, producers have been able to transport wood supplies over much greater distances than was economically possible in the early 1950's.

The trend toward the use of locally available hardwoods has increased the competition for available stumpage and wood supplies among mills with overlapping timbersheds. Increases in absolute pulpwood consumption, increased competition for available pulpwood supplies, and a relatively fixed total wood inventory have forced many Lake States mills to take a more active part in wood procurement activities to insure that mill wood requirements are met.

Pulp companies' interest in safeguarding future wood supplies has encouraged more direct contact between mills and the lower strata of the pulpwood marketing chain. Pulp company participation in such programs as Wisconsin's Trees for Tomorrow, the Tree Farm Program, and other such forest industry programs are indicative of the concern over future wood supplies.

The increased use of pulping processes requiring green wood has also encouraged the use of company procurement staffs rather than dealers. These processes require a relatively constant flow of freshly cut pulpwood. Under such conditions, wood procurement activities must

be extremely flexible and closely tied to paper mill operations. Short-term changes in mill wood requirements cannot be offset by fluctuations in inventories or wood purchase activities. The requirement of green wood necessitates frequent and rapid adjustments in the flow of pulpwood to mill yards. Mills utilizing green wood have found that dealers cannot provide the needed flexibility in deliveries, and they have been forced to utilize procurement systems involving direct contact between the pulpwood producer and the mill.

A procurement system widely used by sampled Wisconsin mills with annual wood requirements in excess of 50,000 cords involves the use of company employees or contracted pulpwood cutters. In total, 18 mills employed this system in 1959--16 in Wisconsin and 2 in Minnesota. Only 2 mills, both Wisconsin firms, maintain their own logging camps. This method is used as a unique means of obtaining wood supplies by only one firm, a Minnesota mill. Other mills generally obtain less than 25 percent of their total receipts from contract cutters or company employees.

Sampled Wisconsin and Minnesota mills obtained 436,000 cords of pulpwood from contract cutters in 1959. This system of contracting offers advantages both to the contractor and to the mill. By contracting with independent cutters on a piece-rate basis, mills can assume a fairly active role in wood production activities without the expense of maintaining their own labor force. Through the use of contract cutters, mills can frequently avoid the necessity of making large financial investments in logging equipment, paying idle pulpwood cutters when weather conditions prohibit woods operations, and paying workman's

compensation premiums.[5] The operator benefits by not having to obtain his own source of stumpage and by having an assured market.

Wood Purchase Agreements

Policy concerning agreements with suppliers for cut wood purchases varies by mill. Notable differences occur in the initiation and timing as well as in the form and details of the agreements.

Pulp companies drawing wood from highly competitive timbersheds are generally more active in initiating wood purchase agreements with suppliers than those drawing supplies from timbersheds in which little or no competition is encountered.

Two-thirds of the Central States mills and about half of the Lake States mills report that suppliers usually initiate pulpwood sales. The remaining mills indicate either that they assume the active role in contract initiation or that negotiations originate from both sides, depending on the situation at the time. Mills with large annual wood requirements or which purchase from large operators usually seek out their more important suppliers and discuss new contracts before the logging season gets under way. Large mills obtaining their wood from numerous small operators and operating under favorable market conditions, or mills purchasing relatively small amounts of pulpwood often supplement other supply sources or obtain all of their

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[5] In 1961 workman's compensation premiums for pulpwood cutters amounted to $17.73 per hundred dollars of payroll in Wisconsin and $11.53 in Minnesota. (Figures quoted in letter from D. D. Smith, National Council on Compensation Insurance, New York.)

wood requirements through newspaper and less formal advertising or by waiting for suppliers to come to them.

Wood purchase agreements are often informal. Procurement agents may favor this type of agreement on the assumption that wood purchases are more easily adjusted to mill needs. The assumption here is that purchases may be reduced or prices adjusted with less friction than where formal agreements are made.

Informal agreements may be in the form of an oral understanding between a mill representative and a supplier. They may be in the form of a letter stating that the mill is in need of pulpwood. Some mills distribute pulpwood delivery tickets which enable the bearer to deliver a given number of cords in a specified time period. Other mills may make a public offer to purchase all wood meeting mill specifications that suppliers are able to deliver. In the latter case, the offer to purchase may be terminated simply by the removal of the posted notice. Only 10 of the sampled mills use informal contracts, and only half of these use such contracts exclusively.

Most of the wood purchased by sampled mills is obtained under some type of written agreement.. By state, 5 Michigan, 21 Wisconsin, 4 Minnesota and 5 Central States mills use some type of formal agreement with all of their suppliers (Table 18). Four other mills, all Lake States firms, use both informal and written contracts.

Written agreements may or may not be considered formal contracts. Most Wisconsin and Michigan mills using written agreements do not consider their contracts binding upon the mill or the supplier.

Table 18.--Number of sampled mills using different types of contracts for cut wood purchases, 1959

Study area	Written agreement		Informal agreement[a]	
	Mills	Volume of pulpwood	Mills	Volume of pulpwood
	(Number)	(Percent)	(Number)	(Percent)
Michigan	5	92	4	8
Wisconsin	24	91	4	9
Minnesota[b]	4	96	1	4
Lake States	33	91	9	9
Indiana			1	100
Illinois	2	100		
Iowa	1	100		
Missouri	1	100		
Central States[c]	4	65	1	35

[a]Includes standing offers to purchase delivered wood.

[b]Excludes one Minnesota company which purchases all of its wood supplies from contract cutters.

[c]Totals exclude the nonreporting Ohio mill.

All five Michigan mills and most of the Wisconsin and Minnesota using written agreements, regardless of their form, do not consider these agreements enforcible. Most of these mills, however, consider it to be in their long-run interest to purchase the amounts of pulpwood to which they have agreed.

Although formal purchase agreements may not be considered legally binding, most suppliers are indirectly bound to deliver contracted amounts. A supplier who does not deliver his contracted quota during the allotted time period is usually assured of a smaller or no quota in the following contract period. In general, written agreements between mills and suppliers are heavily weighted in the buyer's favor.

As a general rule, mills that make prior-to-delivery agreements with suppliers establish their lines of supply 2 to 4 months in advance of actual deliveries. Some Michigan and Wisconsin mills which rely upon large operators and use formal written contracts estimate their wood requirements well in advance and try to formalize their supply arrangements 6 months to one year in advance of actual deliveries.

Formal purchase agreements usually include details concerning the volume and price per cord of each species to be purchased, method and time of payment, specifications of acceptable wood and method of delivery. Lake States contracts often include declarations by the supplier that title to the wood is clear and that production is in compliance with all state and federal laws relating to workman's compensation, wages and hours, and employment of minors.

Payment is usually made upon delivery or within two weeks. Acceptable wood must be cut from sound live trees and be reasonably

free from sweep or crook, dirt, rot and fire damage. In the Lake States, lengths are usually standardized at 96 inches or 100 inches. Short bolts of 48 or 50 inches are accepted by some mills. One mill requires 55-inch bolts. Minimum small end diameters are usually set at 4 inches, but a 3-inch diameter may be acceptable for scarce species such as spruce and balsam. Central States mills usually specify maximum bolt lengths of 5 feet, although one mill purchases bolts ranging from 6 to 7 1/2 feet in length. Minimum small end diameters are usually set at 3 inches. Maximum diameters range from 7 to 20 inches.

The unit of measure most commonly used in the Lake States is the standard cord of 128 cubic feet, representing a volume of wood 4 feet high, 4 feet wide and 8 feet deep. One Lake States mill purchases by weight and a Michigan firm requiring 55-inch sticks uses a cord of 146.6 cubic feet. Five Central States mills purchase by the ton, and one mill, by the long-cord of 160 cubic feet. With few exceptions, measurement is a right held by the buyer.

Contracts usually do not specify delivery dates, in recognition of weather, labor, transportation and other problems of suppliers in meeting their wood delivery commitments. However, companies sometimes try to control the timing of deliveries by including monthly quotas in their contracts. An Ohio mill regulates deliveries by issuing delivery tickets specifying the maximum number of cords a producer may deliver per week for a period of several weeks. Several Lake States mills use a contract covering a period of 3 to 6 months with the provision that a given number of cords be delivered per month or week. Most mills,

however, attempt to regulate the flow of pulpwood to their mills simply by including a provision specifying that the contracted amount be delivered within the time period of the contract.

Seasonal Deliveries and Wood Storage

Pulpwood delivery patterns are highly seasonal. All sampled pulp mills, except one (an Ohio firm), reported marked seasonal fluctuations in pulpwood receipts during 1959. A typical pattern of deliveries is hard to find. All Central States mills had somewhat different patterns. In the Lake States, a typical pattern could be distinguished for Wisconsin and Minnesota mills, and another pattern for Michigan.

Pulpwood receipts in Wisconsin and Minnesota were at a maximum in January, February, and March and at a minimum during April and May. After reaching the seasonal low, deliveries continued at a relatively low level and did not pick up again until late summer. The seasonal pattern of deliveries reported by Lower Michigan mills was somewhat different from that reported in Wisconsin and Minnesota. In Michigan, receipts reached their peak in late summer and were at a minimum from late March to early June.

Lake States pulp companies report periods of minimum deliveries mainly in terms of weather conditions. In Wisconsin and Minnesota, for example, adverse weather and road conditions in April and May virtually eliminated truck deliveries to mills and rail reload points. In Lower Michigan, highway weight restrictions in effect from March 1 to May 31 (FDW, 1961) caused a marked reduction in the rate of deliveries during the early part of the year.

Timing of maximum wood deliveries are explained by many North Central pulp companies in terms of the availability of woods labor and its influence upon the "logging season". In the Central States, the so-called logging season is determined primarily by the availability of farm labor during the off-farm season. Lake States mills define the logging season in terms of both the availability of seasonal woods labor and weather conditions. The spruce-fir logging season, for example, occurs from November to March. Sampled mill officials claim that most of the spruce and fir they purchase is produced during this time period either because (1) the sites upon which spruce and fir grow are too wet to be logged at a profit during the summer months, or (2) these species are produced mainly by seasonal workers who are not available at other times.

Since pine and aspen are usually found on sites that can be logged throughout the year, the logging season for these species is explained mainly in terms of the availability of labor. Hand-peeled aspen is most commonly produced by part-time workers before the farm planting season in spring or early summer when growth is vigorous and bark most easily removed. The increased use of portable mechanical barkers, however, is making year-round production of peeled aspen economically feasible and has reduced the seasonality of production.

All sampled pulp mills stockpile pulpwood in their yards. Since most pulp mills normally operate at or near capacity on a year-round basis, seasonal variations in the level of inventory carried are closely tied to seasonal variations in pulpwood receipts. Only one mill, the Ohio firm that reported steady year-round deliveries, does

not experience seasonal fluctuations in the size of inventory carried. Inventories build up rapidly during the periods of maximum pulpwood deliveries. As the volume of pulpwood purchases tapers off, pulp mills rely on the accumulated inventories for the majority of their wood requirements. Inventories are reduced to a minimum just prior to the beginning of the next logging season when purchasing activities get under way in earnest again and large volumes of pulpwood begin to move into pulp company yards.

The size of inventories accumulated during periods of maximum pulpwood receipts is variable, ranging upward from 5 or 6 months supply to inventories large enough to operate pulp mills for more than a year. Inventories may be depleted to as little as one months supply, but as assurance against uncertainties in pulpwood deliveries and of uncertainties about mill requirements for pulpwood most mills prefer to have several months supply on hand at all times. The preference appears to be for a minimum inventory sufficient to supply mill requirements for 4 or 5 months.

The amount of inventory preferred by mills is influenced by a number of factors. Management is strongly influenced by the desire to hold investment in stored wood at the lowest level which will insure uninterrupted mill operation, but judgment as to what constitutes the lowest practicable level varies. Mills which manufacture products requiring the use of dry, uniformly aged wood generally carry larger inventories than mills which do not require uniformly aged wood or which have a technological preference for freshly cut wood. Again, mills manufacturing a number of products, or which require a number of

pulpwood species, generally carry larger inventories than those manufacturing only one product or which utilize only one species. Storage capacity in the yards, together with unloading facilities, may also affect the levels at which pulpwood can be stockpiled.

Sixty percent of the sampled mills indicate a preference for seasonally fluctuating levels of inventories. The reasons are variable. Three Lake States mills claim that the primary factor responsible for seasonal variations in inventories is mill management's desire to have a minimum level of inventories on hand at the time of property tax assessment. A few mills which produce paper products with a moderate seasonal demand report that inventory goals are based upon seasonal wood requirements. Most commonly, however, this expression of preference is simply an approval of purchase in accord with weather conditions and the availability of seasonal woods labor.

The incentives for seasonal purchases which correspond to the so-called logging season are great. Mills receiving highly seasonal deliveries usually purchase from large numbers of producers, most of whom deliver less than 200 cords. The supply of seasonal labor is plentiful; most mills report they are generally offered more wood by seasonal producers than they require. As long as pulp company policy condones seasonally fluctuating levels of wood inventories, seasonal pulpwood purchases facilitate a relatively simple system of coordination between wood suppliers, wood procurement personnel and the mill's production department. More uniform levels of pulpwood deliveries and smaller inventories require greater organizational efforts in the planning, scheduling and controlling of pulpwood deliveries. They also

require greater efforts in resolving difficulties caused by unanticipated changes in pulpwood deliveries or mill requirements.

Forty percent of the mills sampled expressed a preference for constant levels of wood inventories. A few of these firms report inventory levels which experience relatively little seasonal fluctuations, but most report wide seasonal swings in the volume of wood stored in their yards. The inability of these mills to control inventory levels is not easy to explain. However, there is reason to believe that the majority of mills which expressed a desire for uniform levels of inventory recognize the desirability of attainment of this idealized objective but feel that the costs (presumably in the form of higher prices) exceed the benefits. Mills which experience relatively little fluctuation in inventories obtain the bulk of their wood requirements from small numbers of specialized pulpwood producers who deliver wood on a year-round basis under mill initiated 12 month quotas. Mills who have not obtained their proclaimed goals usually purchase from large numbers of small producers who deliver pulpwood without prior supplier-mill agreement or under 2 to 4 month purchase agreements which are supplier initiated and specify delivery dates which correspond to the "logging season".

CHAPTER V

PULPWOOD MIDDLEMEN

The pulpwood middleman is an individual (or firm) who operates as an independent agent between the pulpwood producer and the pulp company. In the North Central region, pulpwood middlemen or intermediate marketing agents are commonly referred to as "dealers".

Pulpwood dealers operating in the North Central region can be grouped into two classes--merchant middlemen and agent middlemen (Phillips and Duncan, 1956). Dealers operating as merchant middlemen specialize in the buying and selling of pulpwood and actually take title to the pulpwood they handle. Agent middlemen act as brokers or as commission agents. These dealers do not take title to the pulpwood they handle but act as agents who assist in effecting transfer of ownership between the pulpwood producer and the primary manufacturer. Pulpwood commission agents are distinguished from brokers in that they actually handle the pulpwood they sell; brokers do not.

Pulpwood brokers and commission agents receive a commission of $0.50 to $1.50 per cord for their services. Merchant middlemen are usually not recognized as true dealers by pulp and paper companies and, consequently, are not bound by the price policy of their buyers. This type of agent is usually regarded as a producer by his buyers but as a dealer by his suppliers. Merchant middlemen receive remuneration for their services by purchasing pulpwood from producers at a price low enough to cover operating expenses and provide a margin for profit.

The primary marketing function of the pulpwood middlemen is to facilitate the movement of pulpwood from the producer to the consumer, but the middleman also performs a number of other services which are of value to both the producer and manufacturer. By purchasing through middlemen, pulp companies are relieved of many of the costs and problems of dealing with large numbers of producers who may be located at considerable distances from their plants. By selling through middlemen, producers often find a convenient market which would otherwise be difficult to reach. Middlemen frequently provide financial assistance to producers and assistance in transporting their products.[6]

In practice, the distinction between a commission agent and a broker may not be clear or important. The marketing functions performed by each of these agents are similar; only their methods of channeling pulpwood from the producer to the mill differ. The distinction between agent middlemen and merchant middlemen is important. Agent middlemen, at least in the short-run, owe their existence to and are remunerated by the pulpwood buyer. Merchant middlemen exist because of the services they offer producers, not consumers.

Sample Size

The sample of pulpwood dealers interviewed included 84 firms--74 in the Lake States study areas and 10 in the Central States. Eight of the 10 Central States' dealers sampled were interviewed in the Ohio

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[6]Other marketing functions typically performed by middlemen such as shortage, risk-bearing and grading are not often assumed by North Central pulpwood dealers.

study area; they handled 20 percent of the pulpwood marketed by Ohio producers in 1959. Elsewhere in the Central States, dealers are relatively unimportant.[7]

The Lake States dealer sample included 29 Michigan firms, 31 Wisconsin firms, and 14 Minnesota firms. Volumes handled by sampled dealers in the Lake States represent the following proportions of the pulpwood marketed by producers: 17 percent in Lower Michigan, 26 percent in Wisconsin, and 15 percent in Minnesota.

The geographic relationships between the locations of dealers sampled and mills that are known to have purchased from middlemen in 1959 are shown in Figure 15. For the most part, the bases of operation of dealers interviewed are located at considerable distances from their markets. Middlemen located within economical truck-haul distances from markets generally act as merchant middlemen and do not receive a commission from pulp companies. It should be noted, however, that only those pulp companies which formally recognize middlemen (i.e., pay a commission for their services) are shown in Figure 15. Many Lake States merchant middlemen also sell to mills which do not recognize any dealers.

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[7]Two dealers were interviewed, one in Indiana and one in Illinois, but since they are the only known dealers in their areas and thus identifiable, they have been eliminated from this analysis.

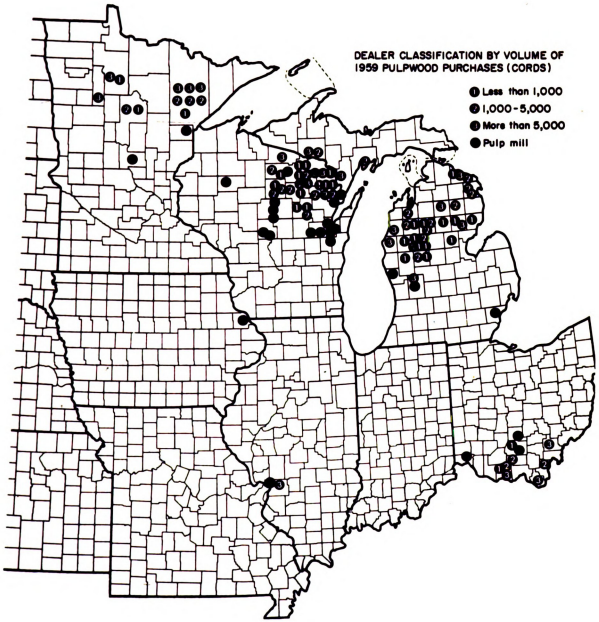

Fig. 15. Locations of sampled dealers in the Lake States and Pulp mills which recognize dealers in their pulpwood purchases, 1959.

Characteristics of Dealers

Dealer operations range in size from less than 200 cords per year to more than 100,000 cords. The size distribution of dealer operations is summarized in Table 19. About three-fourths of the dealers sampled handled less than 5,000 cords in 1959. The average volume was 1,100 cords in Michigan and Wisconsin, 5,600 in Ohio, and 10,400 in Minnesota.

Sixty percent of the dealers sampled are merchant middlemen. However, only in the Michigan study area do merchant middlemen handle a substantial portion of the pulpwood volume moving through dealer channels (Table 20). Elsewhere in the region, merchant middlemen handle very small volumes in comparison with agent middlemen.

There are few newly established dealers in the North Central region, Wisconsin dealers sampled have been handling pulpwood for an average of 18 years. Minnesota dealers average 25 years, and Michigan and Ohio dealers, 13 years.

The relatively high average age of sampled Wisconsin and Minnesota dealers is an indication of the declining importance of this type of agent as a market functionary. In these areas, it appears that many mills have maintained their dealer suppliers but, at the same time, have adopted a policy of obtaining increased wood requirements from independent producers or company logging operations. This supposition is supported by the fact that the volumes handled by sampled Minnesota and Wisconsin dealers have not changed significantly since 1950.

Table 19.--Size class of sampled pulpwood dealers, by study area, 1959

Size class	Michigan	Wisconsin	Minnesota	Ohio
(Cords handled)		(Number of dealers)		
1,000 or less	13	12	3	2
1,001 - 5,000	10	12	6	4
5,001 - 10,000	3	1	3	1
More than 10,000	3	6	2	1
Total	29	31	14	8

Table 20.--Sampled dealers classified by market function, by study area, 1959

Study area	Agent middlemen		Merchant middlemen	
	Number of dealers	Volume handled (M cords)	Number of dealers	Volume handled (M cords)
Michigan[a]	10	33.0	21	56.4
Wisconsin[b]	13	227.5	19	16.4
Minnesota	11	143.3	3	2.2
Ohio	6	33.6	2	.5

[a]Two dealers function both as agent middlemen and as merchant middlemen.

[b]One dealer functions both as an agent middleman and as a merchant middleman.

In the Michigan study area, too, the role of dealers appears to be shrinking. The larger dealers, usually agent middlemen, have been established for more than 10 years; new dealers find it very difficult to break into the marketing chain. Long-established dealers have maintained working relationships with several of the Lower Michigan pulp mills, but they have either lost or have never gained recognition by that portion of the pulp industry which accounts for the major expansion which has occurred in the area. Failure of the new or expanding pulp companies in Lower Michigan to recognize dealers does not prevent merchant middlemen from becoming established, but it does eliminate the agent middleman function.

Pulp company policy in the Ohio study area appears to point in a different direction. Seventy percent of the wood volume handled by dealers in this area in 1959 was moved by dealers who had been in business less than 5 years. The existence of relatively new firms which are recognized agents and which handle large volumes of pulpwood indicate that Ohio pulp mills consider the advantages of the dealer system to outweigh the disadvantages.

North Central pulpwood dealers frequently are part-time dealers who combine other occupations with their timber operations. Only 46 percent of the dealers sampled are engaged full-time in the marketing of timber products (Table 21). In general, full-time dealers are the "larger" operators;[8] nearly 80 percent of the full-time dealers handle more than 5,000 cords annually (as compared to 15 percent for part-time dealers).

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[8]Arbitrarily, "larger" or "large" dealers are defined as those handling at least 5,000 cords.

Table 21.--Occupations of pulpwood dealers sampled, by study area, 1959

Occupation	Michigan	Wisconsin	Minnesota	Ohio
		(Number of firms)		
Full-time dealers:				
Regular	12	15	9	2
Cooperative association	1			
Total	13	15	9	2
Part-time dealers:				
Sawmill operator	3	1	2	2
Store operator	1	2		1
Farmer	5	3		1
Wage earner	1	1		1
Other[a]	6	9	3	1
Total	16	16	5	6
All dealers	29	31	14	8

[a]Includes firms engaged in more than one of the listed occupations and firms not reporting the nature of their alternate occupations.

Full-time dealers accounted for nearly 70 percent of the pulpwood volumes handled by sampled dealers.

Part-time dealers engage in a number of occupations, some of which are not closely related to timber-based industries. Seven of the dealers sampled operate sawmills; four are store operators; and 10, farmers. Wage earners and individuals engaged in a number of other miscellaneous occupations are also represented strongly in the sample. For many part-time dealers, such as farmers, laborers, and heavy equipment operators, timber-products marketing is a sideline activity which is carried on during the slack season of their alternate occupations. Others, such as store operators, engage in timber-products marketing on a year-round basis but only as a part-time activity. Roughly half of the part-time dealers obtain over 50 percent of their gross income from timber-products marketing.

Timber Handled

Pulpwood dealers generally specialize in the marketing of pulpwood. Of the 82 dealers sampled, 50 confine their intermediate marketing activities to pulpwood. Thirty-two dealers also market other timber products, but these are usually sideline products.

Pulpwood

A breakdown of the species purchased by dealers is given in Table 22. Ohio dealers handle only mixed hardwoods, the major pulpwood species group in that state. In Michigan, a number of pulpwood

Table 22.--Timber handled by sampled pulpwood dealers, by study area, 1959

	Unit of measure	Michigan	Wisconsin	Minnesota	Ohio
		Pulpwood[a]			
Aspen	M cords	60.2	94.9	.1	
Mixed hardwoods	M cords		11.3		34.1
Pine	M cords	17.1	23.9	.1	
Spruce-fir	M cords	12.1	29.5		
Unknown[b]	M cords		84.3	145.3	
Total	M cords	89.4	243.9	145.5	34.1
		Other products			
Sawlogs	M bd. ft.	175	449	2,541	
Veneer logs	M bd. ft.		293	(c)	(c)
Stave bolts	M bolt ft.				(c)
Posts-poles	M pieces	67	790	14	

[a]Michigan, Minnesota and Wisconsin producer-dealers purchased 21,300, 6,200 and 22,100 cords of pulpwood, respectively, as stumpage.

[b]Volumes by species not reported.

[c]Withheld to avoid disclosure of firm identity.

species are handled, but two-thirds of the dealers specialize in the marketing of a single species, usually peeled aspen. These single-species dealers are usually small operators who engage in pulpwood marketing on a seasonal basis. A similar situation exists in Wisconsin. Here, half the dealers handle a single species, usually peeled aspen, and like their counterparts in Michigan are small operators. Only in Minnesota does the predominant pattern of species specialization break down. In this study area, dealers in all size classes generally buy and sell three or more pulpwood species.

Other Products Handled

Three Ohio and 29 Lake States pulpwood dealers also handle other timber products as intermediate agents. Some of these dealers purchase products that their suppliers produce in conjunction with pulpwood production. In Wisconsin and Michigan, for example, dealers who purchase spruce and balsam pulpwood also purchase cedar posts and poles. Cedar often occurs in association with spruce and balsam and producers usually find it more convenient to market the relatively small smounts of cedar they handle through pulpwood dealers than to seek out a separate, more remunerative market outlet (Manthy and James, 1963).

Dealers who are primarily interested in pulpwood handle other timber products in order to (1) expand their scale of operations or (2) cushion the effects of the seasonality of pulpwood production and orders. Several dealers report that they attempted to expand their pulpwood operations but were unable to obtain larger contracts from their present buyers or to obtain contracts with additional pulp mills.

These firms expanded their operations by handling other products. Similarly, full-time dealers who hold delivery contracts for pulpwood species which have a seasonal demand (or which are produced on a seasonal basis) adjust to this seasonality by handling other products which are marketed on a year-round basis or which are produced when pulpwood logging is at its seasonal low.

About 4 out of 10 dealers also function as producers. All of these firms handle less than 5,000 cords as dealers, and half of them handle less than 500 cords. They usually handle more pulpwood as producers than they purchase as intermediate agents. In most cases, these producer-dealers are merchant middlemen and are not recognized as dealers by their buyers.

Size of Wood Supply Area

Timbersheds of sampled dealers vary in size (Table 23). In each of the Lake States study areas, the size of a dealer's timbershed is closely related to the size of his operations. Dealers handling large volumes of pulpwood draw their wood supplies from larger timbersheds than do smaller operators. Similar relationships are evident between study areas. The usual radius of operations for Michigan and Wisconsin dealers (who handle an average of 1,100 cords) is between 30 and 50 miles. The average Minnesota dealer handles 10 times as much pulpwood as his Michigan and Wisconsin counterpart and draws his wood supplies from an average distance of 82 miles.

Table 23.--Size of wood supply areas of sampled dealers, by study area and size class of operation, 1959

Size class of operations	Michigan	Wisconsin	Minnesota	Ohio
(Cords)	(Average radius in miles)			
Less than 1,000	26	30	35	35
1,001 - 5,000	30	38	75	45
5,001 - 10,000	55	50	83	30
More than 10,000	60	98	112	40
All size classes	34	47	82	40

Dealers' timbersheds in the Ohio study area do not appear to be related to size of operations. Ohio dealers usually reach out 30 to 40 miles for timber regardless of the size of operations.

Wood Procurement Methods and Policies

Dealers obtain wood supplies from a single supplier to as many as 200 suppliers. The average is 28 in Michigan, 48 in Wisconsin, 118 in Minnesota, and 70 in Ohio (Table 24).[9]

Ohio dealers obtain their wood supplies from smaller producers than Lake States dealers. The average producer purchase by Ohio dealers in 1959 was 61 cords; the average for all Lake States dealers, 123 cords. In each of the study areas, dealers handling over 5,000 cords have larger producers than those handling less than 5,000 cords.

[9]Three dealers in Minnesota and one in Wisconsin also act as second-stage intermediate market agents. In each of these cases, the volumes obtained from first-stage intermediate market agents (usually merchant middlemen) represent only a minor portion of the total volumes handled.

Table 24.--Average number of suppliers and volume supplied for sampled dealers, by study areas and size class of dealer, 1959

Study area and size class of dealer	Average number of suppliers	Average volume per supplier
	(Number)	(Cords)
Michigan:		
Less than 5,000 cords	17	99
More than 5,000 cords	76	138
Weighted average	28	132
Wisconsin:		
Less than 5,000 cords	29	63
More than 5,000 cords	93	177
Weighted average	48	129
Minnesota:		
Less than 5,000 cords	102	30
More than 5,000 cords	140	165
Weighted average	118	97
Ohio:		
Less than 5,000 cords	52	55
More than 5,000 cords	115	68
Weighted average	70	61

Wood Purchase Agreements

Most dealers make some type of agreement with suppliers before purchasing or handling their pulpwood. Only 10 of the sampled firms (3 in Michigan, 3 in Minnesota, 2 in Wisconsin, and 2 in Ohio) do not make prior agreements with suppliers. They purchase wood on a spot basis at designated points of acceptance.

Michigan dealers are more active in initiating wood purchase agreements than dealers in other sections of the region. The sliding price scales offered by Michigan mills encourage long truck hauls by producers. Dealers who operate within these distances often must compete for producer contracts against pulp companies with which they do business. Only the larger dealers, however, are active in seeking out wood suppliers. Fifty-four percent of the volume handled by Michigan dealers is obtained under agreements initiated by dealers (Table 25).

In the Minnesota, Wisconsin, and Ohio study areas, some dealers contact their suppliers before the logging season gets under way, but most operate in areas of surplus production. They either wait for suppliers to contact them or purchase on a spot basis. No distinct relationship is apparent between volumes handled and source of contract initiation.

Purchase agreements may be written or informal. Written agreements range from personal correspondence between the agent and his supplier to detailed "purchase orders" which are signed by both parties. Informal agreements range from oral understandings between dealer and supplier to a public offer by the dealer to purchase all pulpwood delivered to designated points.

Table 25.--Source of contract initiation for pulpwood purchased by sampled dealers, by study area, 1959

Study area	Contract initiated by		No prior agreement or indefinite
	Dealer	Producer	
	(Percent of volume)		
Michigan	54	34	12
Wisconsin	25	70	5
Minnesota	21	28	51
Ohio	15	51	34

Table 26 shows the volumes of pulpwood obtained by dealers under different types of purchase agreements. In Michigan, Minnesota, and Ohio, informal agreements are the standard methods of obtaining wood supplies. In Wisconsin, however, the larger dealers (responsible for the bulk of the pulpwood handled by dealers) use written agreements.

In the strict sense of the word, dealers who function as brokers and commission agents do not "purchase" pulpwood from producers. They do not take title to the pulpwood they handle but merely facilitate transfer of ownership. Agent middlemen who advance money to suppliers for purposes of stumpage acquisition, production or hauling may actually use a purchase contract with indebted suppliers, but they prefer not to distinguish between these contracts and the "purchase orders" they make with other suppliers. These dealers feel that the term "purchase order" correctly describes their relationship with suppliers and does not imply the existence of an employer-employee relationship.

Regardless of the type of agreement used, dealers seldom consider their arrangements with suppliers as legally enforcible. Only when dealers have made prior-to-delivery money advances to producers do they consider their contracts binding.

Ten of the sampled dealers (6 in Minnesota, 3 in Wisconsin, and 1 in Ohio) state that they consider themselves obligated to fulfill all their purchase agreements, but these are exceptional cases. Looseness in purchase agreements and orders is inherent in dealer operations and the functions they perform. More than 90 percent of the dealers sampled insure themselves against the risk of being supplied with pulpwood for which they cannot find markets. They will not handle cut wood unless

Table 26.--Number of sampled dealers using different types of wood procurement agreements, 1959

Study area	Written agreements		Informal agreements[a]	
	Number of dealers	Volume obtained	Number of dealers	Volume obtained
		(Percent)		(Percent)
Michigan	5	1	26	99
Wisconsin[b]	8	86	17	14
Minnesota	7	22	9	78
Ohio			8	100

[a]Includes standing offer to purchase delivered wood.

[b]Excludes data for 9 firms which handled a total of 3,700 cords (1.5 percent of the volume handled by sampled dealers). These firms did not report the type of purchase agreement used with suppliers.

they have a contract for resale or delivery at the time of producer delivery.

Except in Michigan, dealers in the North Central region who make prior-to-delivery agreements with suppliers usually specify approximate or maximum volumes in their agreements. This is done even though most dealers will not accept producer wood unless a contract for resale or delivery is in hand. In Michigan, however, three-fourths of the dealers sampled do not specify volumes in their agreements with producers.

Time Period of Deliveries and Payment

Contracts are negotiated from a few days to several months before delivery. Formal or written purchase agreements are generally drawn up several months in advance of deliveries. Oral agreements are usually made less than a month before wood is delivered or picked up at roadside.

Most dealers do not indicate specific delivery dates in their agreements with producers. The usual procedure (whether agreements are formal or informal) is to specify that pulpwood should be delivered at the producer's convenience during a stated period or before a given date. The only class of dealers that attempts to schedule purchase dates are those merchant middlemen who purchase roadside. In this case, pick-ups are usually scheduled every two weeks.

Payment is made by the cord or the ton, either upon delivery, on a weekly or biweekly basis, or upon receipt of the pulp-mill scale. Small agent middlemen and those dealers not recognized as such by pulp

mills generally pay producers upon delivery, although dealers short of funds may postpone payment until they have made delivery and received payment from their buyers. Many dealers acting as agent middlemen make partial payment upon delivery to loading points. Full payment is postponed until receipt of the pulp mill scale. This avoids disputes with suppliers about the volumes delivered. It also aids the dealer by reducing the amount of personal capital needed for the financing of dealer operations.

Prices paid are standardized. All suppliers delivering a given species to a designated point of acceptance generally receive the same price. However, 14 of the sampled dealers (4 in Michigan, 7 in Wisconsin, and 3 in Minnesota) pay different prices based on distance of haul. The latter dealers usually pay suppliers a bonus of $0.50 to $1.00 per cord for wood hauled distances of 50 to 100 miles. Some dealers who purchase pulpwood roadside also pay variable prices depending primarily on the hauling distances involved.

Points of Acceptance

Dealers' purchase orders and agreements specify that pulpwood will be accepted at roadside, at the dealer's or pulp company's yard, or f.o.b. railroad. Twenty of the sampled dealers will accept or purchase pulpwood at two or more of these points.

Most Michigan dealers in all size classes and about half of the smaller dealers in Wisconsin make roadside pick-ups. However, in terms of volume, roadside purchases are important only in Michigan (Table 27).

Table 27.--Points of acceptance by dealers from suppliers of pulpwood, by study area, 1959

Study area and size class of dealer	Roadside	F.o.b. railroad	Delivered to dealer's yard	Delivered to mill
(Cords)	(Percent of volume)			
Michigan:				
Less than 5,000	72	24	4	--
More than 5,000	66	20	--	14
Average	68	21	1	10
Wisconsin:				
Less than 5,000	39	50	7	4
More than 5,000	--	66	7	27
Average	5	64	7	24
Minnesota:				
Less than 5,000	a	73	11	16
More than 5,000	--	49	48	3
Average	a	52	43	5
Ohio:				
Less than 5,000	4	49	1	46
More than 5,000	--	71	29	--
Average	2	62	17	19

[a]Negligible.

Merchant middlemen who purchase roadside transport pulpwood to pulp companies with their own vehicles. Agent middlemen who accept pulpwood stacked at roadside usually contract with independent truckers to transport pulpwood to railroad loading points or directly to pulp companies.

Agent middlemen, particularly in Wisconsin and Minnesota, usually ship pulpwood to pulp mills by rail. Those dealers who handle volumes large enough to load rail cars directly purchase f.o.b. railroad. Dealers who do not receive a constant flow of pulpwood from suppliers and those shipping by truck accept pulpwood delivered to their yards. In the latter case, pulpwood may be stockpiled until enough wood is available to fill a given number of rail cars or to provide an inventory large enough to insure the continuous operation of loading equipment and trucks.

Two dealers who purchase delivered to their yards (one in Ohio and one in Wisconsin) were the only dealers sampled who reported that their buyers requested a constant rate of delivery on a year-round basis. In each of these cases, wood is stockpiled by the dealers to insure a constant flow of wood into mill yards.

Purchase agreements used by 10 Lake States and 2 Ohio dealers specify that producer deliveries are to be made directly to pulp mills. Five are agent middlemen who are located relatively close to pulp mill markets. The remaining seven firms are merchant middlemen who allow other producers to deliver directly to pulp mills under the dealers' quotas.

Aids Offered to Producers

Pulpwood dealers generally offer loans to producers in advance of the time of payment specified in their standard contracts. Specifically, all but 9 Lake States dealers and 2 Ohio dealers offered loans or prepayments to producers in 1959.

The size of the loans or prepayments and the purposes for which they are made vary. Some dealers set an upper limit to the amount offered; others limit loans to some percentage of the value of the contracted quota or the volume of pulpwood likely to be produced. Most dealers do not have established policies with respect to the amount they will lend.

A few dealers advance money to producers for stumpage purchases or operating expenses, but these are exceptional cases. Most dealers offer money advances only for the purpose of (1) covering expenses incurred in the production of pulpwood stacked and ready for delivery, or (2) transporting this pulpwood to the normal point of acceptance. Since these loans are actually for work already performed and are of a short-term nature, interest is not often charged. Only five dealers charge interest on producer loans.

Aids other than loans are regularly offered by 5 of the sampled dealers in Michigan, 14 in Wisconsin, 4 in Minnesota and 1 in Ohio. These aids are variable in kind. Some dealers assist producers in financing equipment purchases by acting as a collection agent for credit institutions; others merely inform lenders that a producer has been awarded a purchase order. Five dealers report that they supply producers with needed logging equipment. However, there is some question

as to whether this is a matter of supplying employees or offering aid to independent producers. Other forms of aid include the furnishing of technical advice on methods of pulpwood production, assistance in finding markets for timber products other than pulpwood, and posting of market supply and demand conditions.

Deliveries of Pulpwood

Strong seasonal trends are evident in the deliveries of pulpwood to pulp mills by dealers. Only five sampled dealers report steady year-round deliveries.

In Wisconsin and Minnesota, the volume of pulpwood delivered to mills by dealers in 1959 was at a maximum during December, January, February, and early March. Minimum deliveries occurred during the period of late March through June. In the Michigan and Ohio study areas, deliveries were at a maximum during the summer and early fall and at a minimum during the first four months of the year.

In each of the study areas, the pattern of deliveries reported by dealers corresponds closely to the pattern of pulpwood receipts reported by sampled primary manufacturers. This would be expected since only nine of the sampled dealers maintain inventories of pulpwood. Most dealers attempt to transfer producer deliveries to pulp mills as rapidly as possible.

The number of buyers with whom dealers held contracts in 1959 is shown in Table 28. Agent middlemen and most merchant middlemen deal directly with pulp and paper companies. Eight dealers (merchant middlemen) market their pulpwood to other dealers (usually agent middlemen).

Table 28.--Number of outlets for sampled dealers, by study area and size class of operation, 1959

Study area and size class	Number of outlets									Not specified
	1	2	3	4	5	6	7	8	9	
(Cords)	(Number of dealers)									
Michigan:										
Less than 5,000	18	2	1	2						
More than 5,000	2	2	2							
Total	20	4	3	2						
Wisconsin:										
Less than 5,000	1	1	2			2			1	2
More than 5,000	1		1	1				1	1	
Total	2	1	3	1		2		1	2	2
Minnesota:										
Less than 5,000	6	5	2	3				2	2	2
More than 5,000				1		1	2	1	2	
Total	6	5	2	4		1	2	3	4	2
Ohio:										
Less than 5,000	4	2								
More than 5,000		2								
Total	4	4								

In the Michigan and Ohio study areas most dealers, regardless of their size, hold contracts with fewer than three buyers. In Wisconsin and Minnesota, however, a dealer may have six or more buyers. Large dealers usually, but not always, have more pulp-mill outlets than dealers handling less than 5,000 cords.

Some dealers who make deliveries to more than one pulp mill do so primarily because they are unable to obtain large contracts with individual mills.[10] In order to maintain scale of operations, these dealers find it necessary to seek contracts with several buyers. Other dealers handle a number of pulpwood species and hold delivery contracts with separate outlets for each of these species. Alternative markets may be sold to simultaneously or at different times of the year.

Many dealers hold contracts with two or more primary manufacturers as a matter of choice. By having alternative outlets, the dealer provides himself with flexibility of operations. If one buyer should request a slow-down in the rate of deliveries on short-term notice, surplus pulpwood can be channeled to other buyers until the dealer can arrange to reduce the volume of producer deliveries.

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[10] As of mid-1963, a number of the Wisconsin and a few Minnesota agent middlemen will be unable to market the same species of pulpwood to more than one Wisconsin mill. A provision of a consent decree between nine Wisconsin pulp companies and the United States Justice Department which arose from an alleged price fixing charge, specifies that the consenting pulp mills are enjoined and restrained from "using as a pulpwood purchasing agent any person who is also an agent for the purchase of the same species of pulpwood for any other consumer of pulpwood..." (U. S. v. Consolidated Papers, Inc., 1963 Trade Regulation Reports [Par. 70, 627, Trade Cas.] Western District Wisconsin, February 7, 1963).

CHAPTER VI

PULPWOOD PRODUCERS

The sample of pulpwood producers interviewed included 192 firms--160 in the Lake States and 32 in the Central States. In the Central States, 8 producers were interviewed in Ohio, 7 in Indiana, 6 in Illinois, and 11 in Iowa. Volumes handled by producers sampled represent as much as one-fourth of total pulpwood production in Indiana and Iowa, but in view of the small numbers of producers involved in individual study areas, the Central States region is considered as a whole in this discussion of pulpwood producers.

The Lake States producer sample included 93 firms in Michigan, 43 in Wisconsin, and 24 in Minnesota. Volumes handled by sampled producers in the Lake States represent the following proportions of 1959 pulpwood production: 26 percent in Lower Michigan, 10 percent in Wisconsin, and 5 percent in Minnesota.

Characteristics of Producers

Sampled producers in the Lake States have been harvesting pulpwood for an average of 13 years. The average is much smaller in the Central States--7 years--but this may be more a result of newness in the industry than of producer turnover.

Longevity in business has not led to growth in size of producer operations. Number of years in operation is tied very weakly to size of operations in the Lake States; and in the Central States the larger producers have been harvesting pulpwood for less than 4 years.

Table 29 shows the bulk of the producers to be relatively small operators. Two-thirds of the Lake States and three-fourths of the Central States sample are small producers;[11] they produced 1,000 cords or less in 1959. Size of operations can be judged against the knowledge that under current conditions, two men fully employed over a year's time can produce and market very close to 1,000 cords of pulpwood.

Eighty percent of the producers sampled hire either full-time or seasonal employees to help in logging and hauling. Smaller firms are usually two-man operations. Full-time operators and part-time producers who work on a year-round basis generally employ 4 or 5 full-time workers. Producers of all sizes hire seasonal woods workers during periods of peak pulpwood demand. Since length of seasonal employment varies greatly, no meaningful average of seasonal employment can be derived.

The "larger" firms are not always full-time producers. Sixty-nine Lake States and 11 Central States producers (representing 42 percent of the producer sample) are full-time operators (Table 30). Only 43 of these firms harvested more than 1,000 cords of pulpwood in 1959. The remaining 26 full-time producers in the sample do not concentrate on pulpwood; they cut pulpwood (1) when it occurs with other timber products in which they are primarily interested, or (2) when the demand for their other products has slackened.

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[11] "Larger" producers are defined as those producing more than 1,000 cords of pulpwood.

Table 29.--Size class of sampled producers, by study area, 1959

Size class	Lake States			Central States
	Michigan	Wisconsin	Minnesota	
(Cords produced)	(Number of producers)			
100 or less	6	11	1	15
101 - 500	41	15	13	6
501 - 1,000	10	6	2	4
1,001 - 2,000	19	3	4	4
More than 2,000	17	8	4	3
Total	93	43	24	32

Table 30.--Occupations of pulpwood producers sampled, by study area, 1959

Occupation	Lake States			Central States
	Michigan	Wisconsin	Minnesota	
	(Number of firms)			
Full-time producer	36	21	12	11
Part-time producer:				
Contract cutter	7		1	
Sawmill operator	12	3	5	3
Store operator	3	1		1
Farmer	22	10	4	14
Wage earner	11	3	2	1
Other	2	5		2
Total	57	22	12	21
All producers	93	43	24	32

More than half of the sampled producers are part-time operators. Forty-five percent of the part-time operators are farmers; 20 percent, sawmill operators or contract cutters; and 35 percent, wage earners, storekeepers, etc.

Some part-time producers such as many sawmill operators and contract cutters, are seasonal woods workers who harvest pulpwood during the slack season of their alternative occupations. Others are primarily producers who engage in other activities only when the demand for pulpwood has slackened. For example, about one-half of the part-time producers who operate farms earn the major portion of their livelihood from timber production. In terms of income, these are timber producers who operate farms as a sideline activity.

Timber Handled

The variety of timber handled by sampled pulpwood producers is shown in Table 31.[12] Pulpwood production covers a number of species. The indication is that the distribution of volume by species handled corresponds roughly to local species consumption by pulp mills. Some uncertainty about this generalization remains since a large part of the volume handled by Wisconsin and Minnesota producers was not identified as to species.

In terms of volume, pulpwood is the major product handled. This is not surprising since some 40 percent of the producers handle pulpwood

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[12]Seventeen members of the sample population are both producers and dealers. Their dealer operations were discussed previously in connection with the activities of pulpwood middlemen. Here, the reference to timber handled is limited to the producer function.

Table 31.--Timber handled by sampled pulpwood producers, by study area, 1959

	Unit of measure	Lake States			Central States
		Michigan	Wisconsin	Minnesota	
			Pulpwood		
Aspen	M cords	85.8	7.6	.1	
Misc. hardwoods	M cords	.7	.4		23.8
Pine	M cords	25.6	6.9		
Hemlock	M cords		.3		
Spruce-fir	M cords	2.3	.8	.4	
Unknown[a]	M cords		20.6	22.6	
Total	M cords	114.4	36.6	23.1	23.8
			Other products		
Sawlogs	M bd.ft.	3,382	1,830	4,770	345
Veneer logs	M bd.ft.	155	549	10	
Posts, poles	M pieces	169	50	9	41

[a] Volume handled by 14 Wisconsin and 22 Minnesota firms who handle two or more pulpwood species but who did not report volume of different species handled.

exclusively, and many of the producers handling other products do so mainly when these other products occur with pulpwood in stands being harvested or when the demand for pulpwood is slack.

The dominance of pulpwood in the operations of sampled producers becomes obvious when all products are converted to equivalent volume terms. Some 90 percent of the total volume is pulpwood. The percentage is higher in some study areas and lower in others, but the minimum--in Minnesota--is 70 percent.

Size of Wood Supply Area

The extent of a producer's timbershed is determined by a number of interrelated factors. These include: (1) the geographic relationship of the producer's home to both suitable stands of timber and available markets; (2) the degree of specialization in occupations, market roles, and species and products handled; (3) the scale of the producer's operations; and (4) the degree of competition encountered for available stumpage.

Part-time producers who cut pulpwood on a seasonal basis do not have very large timbersheds. Stumpage is usually cut in one or two counties; adequate volumes of pulpwood stumpage can usually be obtained within 10 to 20 miles of the producer's home. Timbersheds of full-time producers are somewhat larger--usually 30 to 40 miles in radius in the Lake States and seldom over 30 miles in the Central States. A few producers in the Lake States have a radius of operation of more than 60 miles.

Wood Procurement Methods and Policies

Producers obtain stumpage from their own lands, by direct purchase with their own funds, or from timber provided directly or indirectly by pulp mills and dealers.

Nearly 80 percent of the 196,800 cords cut by sampled producers in 1959 was purchased as stumpage by producers who used their own funds (Table 32). This was the predominant source of stumpage in all study areas. Eighteen Lake States and four Central States producers (mainly farmers) cut stumpage from their own lands. A portion of the stumpage cut by 12 Lake States producers was provided by pulp mills or dealers or was purchased by buyers in the producer's name. Twelve other Lake States producers purchased stumpage with funds received as prior-to-delivery loans from pulp mills and dealers.

Methods of Stumpage Acquisition

About 65 percent of the producers who purchase stumpage report that they usually initiate their contracts with landowners. Other producers, especially the larger ones, are well known in their local areas as stumpage buyers. These producers rely on landowners (both public and private) to initiate some or all of their contracts.

Producers who initiate stumpage contracts are quite active in seeking out desirable stands of timber. Most of them report that they are "always looking" for prospective stumpage. After a suitable stand of timber is located, the landowner is contacted, either personally or by mail, and an offer to purchase is made. Indirect means of obtaining stumpage through newspaper and other local advertising is generally

Table 32.--Source of stumpage harvested by sampled pulpwood producers, by study area, 1959

Source of stumpage	Lake States			Central States
	Michigan	Wisconsin	Minnesota	
	(Thousand cords)			
Producer's own land	4.6	1.8	.7	3.3
Purchased by producer, own funds	87.6	29.5	19.0	19.2
Purchased by producer, funds provided by buyer	13.0	4.5	.6	
Purchased in producer's name by buyer	7.3		.4	
Provided by buyer	2.1	.8	2.4	
All sources	114.6	36.6	23.1	22.5

regarded as ineffective. Only a few of the large, diversified Lake States operators report using advertising to obtain stumpage.

Stumpage contracts with private and public landowners are negotiated from several days to several years before the beginning of harvest operations. In the Lake States, large producers usually negotiate for stumpage from 6 to 18 months in advance of harvest operations. Eight producers buy tracts of timber which are large enough to meet their stumpage requirements for two or more years. Central States producers and the smaller Lake States producers usually negotiate for stumpage less than four months before harvest operations begin.

About half of the producers purchase stumpage in anticipation of obtaining markets for cut products. This situation holds in each of the study areas and does not appear to be related to the size of producer operations.

Purchase Contracts

The number of purchase contracts made annually by producers varies from one to more than 50. As might be expected, the number of purchase contracts is related to size of operations. Lake States producers handling less than 1,000 cords in 1959 held stumpage contracts for an average of 3 separate tracts of timber. The average for larger producers was 6 contracts. In the Central States, producers seldom made more than two or three stumpage purchases in 1959, regardless of the scope or size of their operations.

Nearly 90 percent of the pulpwood stumpage purchased by Lake States producers in 1959 was obtained under some type of written contract

with public and private landowners (Table 33). Only 16 Lake States producers relied entirely on oral contracts for stumpage purchases; 25 others made both oral and written contracts with landowners. In the Central States, oral contracts are standard; some 70 percent of the pulpwood stumpage harvested by producers was obtained under oral contracts.

The relatively heavy use of written contracts in the Lake States is a reflection of both the landownership source of pulpwood and producer's preferences. A substantial portion of the stumpage is obtained from public lands, and public landowners require that stumpage contracts be written. Private sales usually take the contract form requested by the buyer. It is therefore notable that about two-thirds of the stumpage purchased by Lake States producers from private landowners was obtained under written agreements.

Contracts With Private Landowners.

This discussion of stumpage contracts with private landowners refers only to contracts made by Michigan and Wisconsin producers. Insufficient data were collected in other study areas for inclusion here.

Contracts made by Michigan and Wisconsin producers with private landowners usually specify the species, sizes, and quantity of timber to be cut. Regardless of whether the harvest is for pulpwood or is pointed at a number of products, purchase agreements generally indicate that all merchantable timber will be harvested. Only four producers, each of whom specializes in pulpwood, specify the number of cords to be harvested.

Table 33.--Pulpwood stumpage purchased by sampled producers, by type of contract and study area, 1959

Study area	Written contract		Oral contract	Total
	Public landowner	Private landowner		
	(Thousand cords)			
Michigan	70.0	16.0	14.6	100.6
Wisconsin	21.0	10.8	2.2	34.0
Minnesota	16.6	2.2	.8	19.6
Lake States	107.6	29.0	17.6	154.2
Ohio	.8	.6	5.7	7.1
Indiana	.7	1.5	5.4	7.6
Illinois			1.0	1.0
Iowa		2.1	1.4	3.5
Central States	1.5	4.2	13.5	19.2
North Central region	109.1	33.2	31.1	173.4

Stumpage contracts also refer to the time and method of payment. Three-fourths of the Michigan producers make payment after the harvest operation has been completed.[13] Payment is made by the cord and, usually, on the basis of measurement by the producer's buyer. This system offers advantages to both the producer and the landowner. Producers do not have to invest their often limited funds in stumpage; landowners receive payment for the exact volume of merchantable wood harvested. Other producers purchase stumpage by the tract and lump-sum payment is made in advance of harvest operations. Written contracts, negotiated from one to three years in advance of harvest, are generally used in the latter case.

Regardless of the method and time of payment specified, written contracts nearly always indicate the length of time in which logging must be completed. Oral agreements, however, are rarely specific on the time period in which harvest operations are to be performed. Only those producers who make advance payments on stumpage consider themselves bound by their agreements.

Many private landowners who sell stumpage to Michigan and Wisconsin producers specify how logging is to be done. However, the restrictions imposed normally are not motivated by silvicultural objectives. Private hunting clubs, for example, insist that spruce and balsam be clear-cut in strips. While this cutting method is often silviculturally sound, the primary purpose of the restrictions is to

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[13]The situation may be similar in Wisconsin and other study areas, but data are not available for a conclusion on this point.

provide concentrations of slash for wildlife management. Regeneration of the timber stand is a secondary objective.

Most small private landowners who sell stumpage do so infrequently, have little knowledge of the methods of forest management, and have little desire to manage forest holdings on a sustained-yield basis. Restrictions imposed by this class of forest landowner generally relate to such items as the maintenance and preservation of roads, fences, or soil cover, rather than the productivity of forest lands.

Only three producers, none of whom cut more than 200 cords of pulpwood in 1959, report that they are in a market position strong enough for them to refuse to accept any limitations on their logging operations.

Contracts with Public Landowners

In contrast to private sales contracts, pulpwood producers have little control over provisions specified in public stumpage contracts. Public timber sales are governed by formal standardized procedures. Contract details vary by agency, but they always include such items as species, sizes and quantity of timber to be cut, the method and time of payment, the length of time in which logging must be completed, and applicable logging restrictions.

Public sales contracts generally require that all material considered merchantable be removed. This is no problem to the pulpwood producer in small timber sales where the offering may be limited to one species such as aspen. But larger blocks which include a variety of species and size classes pose a problem for the producer who is a

pulpwood specialist. Smaller producers who operate in a limited business framework must confine their bidding to tracts providing few product possibilities, or they must contract with dealers whose business operations include a variety of products.

Most of the region's public landowners make both competitive and noncompetitive sales. Sales for which stumpage values are estimated to be in excess of a designated sum (ranging from $300 to $2,000, depending on the agency) are advertised locally and open to competitive bidding. Sales of smaller value are negotiated directly; the selling price is based on the landowner's appraised values per unit of volume.

Negotiated sales made by public forest landowners are usually more numerous than sales requiring competitive bidding, but competitive sales usually involve a greater total volume of timber.

Payment in advance of timber removal is usually required. The U. S. Forest Service uses a single approach: advance payments for stumpage must be made before timber can be cut. However, since these payments may be made in installments, there is a reasonable limit to the cash resources or credit facilities required of purchasers. Other agencies use various approaches to the problem of payments. At one extreme is the requirement that the successful bidder pay a lump-sum bid price in full when the contract is signed. At the other extreme, payment may be wholly delayed until after the cut timber has been removed from the forest and the producer receives payment from his buyer. These variable approaches have considerable effect on the ability of producers to bid for stumpage.

Time extensions may be made, but most contracts are for periods of less than one year. Occasional large sales are let on a long-term basis. The long-term contract itself may increase the opportunities of small producers to bid on forest tracts, but the combination of long-term with large-block sales tends to restrict the number of bidders.

The various restrictions placed on public stumpage sales go beyond the conditions of the typical private sale. For example, restrictions on the use of equipment or logging layout may be specified to lessen logging damage to the forest; utilization is required to stated minimum top diameters; maximum stump heights may be stated; and there is usually a penalty for unauthorized cutting. In general, the restrictions do not usually place an excessive burden on the pulpwood producer, but they do add to the usual costs of production.

Subcontracting of Logging and Hauling Operations

Forty percent in Michigan and smaller percentages of the pulpwood producers in the other study areas subcontract some or all of their logging operations (Table 34). Such subcontracting is not common among seasonal producers. It is the year-round producer, handling two or more products, harvesting several tracts of timber, and facing seasonal changes in pulpwood demand, who subcontracts logging operations.

Possibly the greatest advantage of subcontracting is that the producer may avoid the expenses normally associated with the maintenance of his own logging crew. Falk (1958) has summarized these as follows:

> Where the employer-employee relationship exists, the employer: (1) Must withhold income taxes; (2) provide social security; (3) be absolutely liable for negligent acts done by the employee in the course of employment; (4) must carry workmen's

Table 34.--Number of sampled producers and volumes involved in subcontracting of logging and hauling operations, by study area, 1959

Study area	Logging operations		Hauling operations	
	Producers	Volume	Producers	Volume
	(Percent of sample)			
Michigan	40	41	23	9
Wisconsin	21	13	50	24
Minnesota	8	3	61	33
Central States	12	12	10	a

[a] Negligible.

> compensation insurance (in most cases); (5) must comply with applicable labor relations acts; and (6) must observe fair labor standards acts, and pay minimum wages. None of these things are necessary if the relationship is not that of employer-employee but the identical work is that of an independent contractor.

Subcontracting of hauling operations is less common than the subcontracting of logging operations in Michigan, but it occurs more frequently in Wisconsin and Minnesota. Of the total regional sample of producers, 27 percent contracted with independent truckers in 1959 to transport a portion or all of their pulpwood output. Two-thirds of these producers are either (1) small timber producers who lack the necessary equipment for hauling pulpwood and are unable or unwilling to make the needed investments, or (2) larger producers who turn to independent truckers for help in delivering pulpwood during periods of peak production or demand. Only five of the sampled producers subcontract hauling primarily because they think it the cheapest way to move pulpwood to markets.

Deliveries of Pulpwood

Producer deliveries follow strong seasonal trends similar to those reported by dealers. Only 3 of the sampled producers reported fairly uniform deliveries throughout the year.

In Minnesota and Wisconsin, the volume of pulpwood delivered by producers was reported to be at a maximum from December to early March. Deliveries fell off rapidly in April, reached a minimum in May, and remained low until winter. In the Michigan and Central States study areas, producers reported that deliveries reached a peak in late summer and were at a minimum during the first quarter of the year.

The large number of seasonal pulpwood producers in the North Central region contributes heavily to these trends. When these producers find it convenient to produce and deliver pulpwood in line with their work alternatives, weather conditions, and contracts, aggregate pulpwood deliveries swell. Conversely, when these producers turn to other occupations, or encounter inclement weather and reluctant buyers, aggregate pulpwood deliveries recede.

Year-round producers do not face the same seasonal variations in deliveries stemming from alternate occupations, but they do encounter two important dislocating factors faced by seasonal producers: (1) weather and road conditions which affect the ease and expense of logging and hauling operations, and (2) seasonality in pulp mill purchase contracts. The importance of these factors was discussed in the chapter on "Primary Manufacturers" under the heading "Seasonal Deliveries and Wood Storage."

Smaller producers, particularly those who are not equipped with trucks specifically designed to haul timber products, choose outlets where small marketing costs are involved. Such producers generally market their pulpwood stacked at roadside or to outlets which are located at short distances from their areas of operations. Larger producers may also sell through local markets, but local outlets are bypassed if the higher prices obtained from less convenient markets exceed additional transportation costs. The latter situation occurs most frequently in Michigan, and to a lesser extent in Wisconsin, where pulp mills encourage long truck hauls to their mills by offering delivery bonuses. Local markets may also be bypassed by producers in need of financial or other aid if such assistance cannot be obtained locally.

In terms of volume, 83 percent of the pulpwood sold by producers in 1959 was sold directly to pulp mills; 17 percent was either sold to or marketed through intermediate agents (Table 35). The percentages vary, but the overall pattern applies to each of the study areas.

Lake States producers selling to primary manufacturers either deliver directly to the pulp mill or sell f.o.b. rail. Producers marketing their pulpwood through agent middlemen or selling to merchant middlemen generally transfer possession or title at roadside or f.o.b. rail. Nine Lake States producers who sold through dealers delivered pulpwood directly to pulp mills under the dealer's contract.

The volume of pulpwood delivered to different locations by sampled producers is summarized in Table 36. Central States producers are generally located within economical truck haul distances from pulp mills and sell on a delivered basis to pulp mill yards. Lake States producers generally sell either delivered to pulp mills or f.o.b. rail, depending primarily upon the nearness of these two types of outlets and transportation costs. Roadside sales were encountered only in the Michigan study area.

Producers generally restrict sales or deliveries to one type of buyer. Only five producers sold pulpwood both to a pulp mill and an intermediate agent. However, sales are frequently made to more than one buyer, particularly in the Lake States (Table 37).

Producers who sell to two or more outlets do not always do so by choice. Some of these operators handle more than one pulpwood species, each of which is sold to buyers who specialize in only one or two species. Others find that they cannot market their entire output to a single buyer, and they are forced to seek more than one outlet.

Table 35.--Sales of pulpwood by sampled producers to pulp mills and dealers, by size class of producer and study area, 1959

Study area and size class	Pulp mills		Dealers		All outlets[a]	
	Number of producers	Volume (M cords)	Number of producers	Volume (M cords)	Number of producers	Volume (M cords)
Michigan						
Less than 1,000	35	13.7	23	7.4	58	21.1
More than 1,000	30	74.2	5	7.6	35	81.8
Total	65	87.9	28	15.0	93	102.9
Wisconsin						
Less than 1,000	22	5.3	11	3.5	33	8.8
More than 1,000	8	18.7	5	7.4	13	26.1
Total	30	24.0	16	10.9	46	34.9
Minnesota						
Less than 1,000	11	3.6	5	1.1	15	4.7
More than 1,000	6	12.8	2	3.2	7	16.0
Total	17	16.4	7	4.3	24	20.7
Central States						
Less than 1,000	25	5.5	3	.8	28	6.3
More than 1,000	6	18.3	-	-	6	18.3
Total	31	23.8	3	.8	34	24.6

[a] Totals may not agree with those shown in Table 31. In each of the study areas, some producers did not market all of the pulpwood harvested during the 1959 logging season.

Table 36.--Points of delivery in pulpwood sales by producers, by study area, 1959

Study area	Roadside	Delivered to rail (or F.o.b.)	Delivered to pulp mill	Total
		(Percent of volume)		
Michigan	20	15	65	100
Wisconsin		44	56	100
Minnesota		38	62	100
Central States		4	96	100

Table 37.--Percentage of producers selling to different numbers of pulp mill and dealer outlets, by study area, 1959

State	Number of pulp mills				Number of dealers			
	1	2	3	4	1	2	3	4
	(Percent of producers)							
Michigan	68	20	9	3	86	11	3	
Wisconsin	37	26	26	11	64	29	1	
Minnesota	33	27	27	13	30	50	10	10
Ohio	100				100			
Indiana	100							
Illinois	80	20			100			
Iowa	80	20						

CHAPTER VII

LANDOWNERSHIP SOURCES OF WOOD

Pulpwood handled by firms sampled in Central States study areas is produced mainly from farm woodlands. Privately owned nonfarm woodlands and public lands account for only 6 and 7 percent, respectively, of the pulpwood handled by Central States producers in 1959. This pattern follows closely the distribution of commercial forest landownership. Forest Survey reports show that the major portion of the commercial forest land in the Ohio (Hutchison and Morgan, 1956), Illinois (King and Winters, 1952), Indiana (Hutchison, 1956) and Iowa (Thornton and Morgan, 1959) study areas is in farm woodlands.

Landownership sources of pulpwood handled by sampled firms in the Lake States study areas are summarized in Table 38. In Michigan, pulpwood volumes in 1959 came about equally from public and privately owned forest lands. In Minnesota, less than a fourth, and in Wisconsin, about 40 percent of the pulpwood produced came from private lands.

Data presented in Table 38 show that the landownership pattern is frequently an uncertain indication of the sources of pulpwood production. Private forest lands in the Lake States generally contribute less to pulpwood production, and public lands more, in proportion to their comparative areas.

A number of factors contribute to the relatively lesser yields of pulpwood from private lands. Size of holding is one factor. The average private forest property in the Lake States is below 70 acres (Lake States Forest Experiment Station, 1956). Small tracts may be an ideal source of stumpage for the small seasonal producer, but larger

Table 38.--Relation of commercial forest landownership and pulpwood production in the Lake States study areas, 1959

Class of ownership	Michigan		Wisconsin		Minnesota	
	Forest ownership	Pulpwood production	Forest ownership	Pulpwood production	Forest ownership	Pulpwood production
	(Percent)					
Farm woodlands	21	20	21	12	15	5
Other private	44	25	34	22	19	14
Total private	65	45	55	34	34	19
National forest	11	22	15	19	15	20
State forest	24	21	5	15	23	26
Other public[a]	[b]	1	25	17	28	19
Total public	34	44	45	51	66	65
Unknown		11		15		16
All sources	100	100	100	100	100	100

[a] Mainly county forest.

[b] Negligible.

operators (who account for three-fourths of Lake States pulpwood production) prefer to purchase stands of timber which are large enough to sustain their operations throughout one or more logging seasons. By confining harvest operations to a single stand, producers avoid extra expenses in locating sources of timber, in moving equipment, and in establishing access or logging roads.

Another factor leading to the lesser output of private lands is the diversity of ownership objectives. Private landowners are heterogeneous, including such groups as farmers, wage earners, professional workers, businessmen, land speculators, forest industries, housewives, retired persons, recreation groups, and undivided estates. A diversity of objectives is involved: in many cases timber production is a secondary objective, at best; in other cases, particularly where recreational objectives are involved, there is objection to any timber harvest.

Again, cutting practices are of considerably poorer average quality on private than on public lands (U. S. Forest Service, 1958). This applies with special force to the small forest holdings. The consequence is that timber yields are diminished on the small private holdings below the levels which apply to forests under technical management.

Public forest lands in the Lake States yield more pulpwood in proportion to area than private lands because (1) large block offerings of stumpage are available to the larger pulpwood producers, (2) the public forests are under technical management, and (3) objectives of the public forest owners usually place strong emphasis on timber production.

In localized areas, objectives other than timber production (such as wildlife or outdoor recreation) may assume first priority, but in most cases, timber production remains a major objective of public landowners. In this respect, public forests provide a stabilizing influence for the Lake States pulpwood industry. The existence of large areas of publicly owned and managed forest lands assures a reliable, steady supply of pulpwood stumpage.[14]

[14]The major portion of State and County forests in the Lake States came into public ownership during the 1930's as tax-delinquent lands. Since these lands are, in general, just reaching the stage of productive yield, they can be expected to provide a greater portion of the needs of the pulp and paper industry in the future (Christen, 1961).

CHAPTER VIII

PULPWOOD PRICES AND PRODUCTION COSTS

This chapter is concerned with prices, costs, and margins in moving pulpwood from the stump to the primary manufacturer.

Pulpwood Prices

Most North Central mills purchase pulpwood either delivered to the mill yard by truck, delivered on board rail cars at designated loading points, or at both of these locations. A few mills also purchase wood which is (1) stacked at roadside ready for loading on trucks, (2) delivered to railroad loading points but not stacked on cars, or (3) delivered to the mill by rail, freight paid. Pulpwood purchased other than f.o.b. rail car or truck-delivered to the mill yard represents only a small portion of total receipts in every study area of the region.

Prices paid by sampled North Central pulp and paper companies for the major pulpwood species trucked to mill yards and f.o.b. railroad are summarized in Tables 39 through 42.

These tables illustrate the variability of prices paid by mills within each study area for a given species and point of purchase. Within each study area, it is also possible to compare prices for different species and to compare trucked-to-mill prices with f.o.b. rail prices. Prices paid by pulp companies located in different study areas can also be compared, but these comparisons need to be drawn carefully.

Table 39.--Base prices paid for pulpwood by Lower Michigan pulp mills, by species and method of delivery, 1959[a]

Mill number	Aspen and paper birch				Misc. Hardwoods	Pine		Spruce		Balsam fir	
	Rough		Peeled		Rough	Rough		Rough		Rough	
	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail
	(Dollars per cord)										
1			17.00								
2	12.00										
3[b]											
4			21.00								
5	12.00				12.00						
6[c]			17.75			16.00					
7	12.00				13.00	16.50					
8			21.00	17.00				32.00	25.00	28.00	21.00
9	12.50	12.50	21.50[d]	18.00		20.00	18.00				

[a]Truck to mill prices are base prices. They do not include special bonuses to large producers or bonuses which most mills pay suppliers for wood trucked from specified distance zones. Delivery bonuses for distance zones are shown in Table 43.

[b]No prices given.

[c]Commission of $0.50 added for trucked rough pine on dealer contracts. $17.00 for peeled aspen and $16.50 for rough pine delivered to mill yard by railroad, if freight is paid by the producer.

[d]Weighted average price for all hauling distances and delivery bonuses. Base price not specified.

Table 40.--Base prices paid for pulpwood by Wisconsin pulp mills, by species and method of delivery, 1959

Mill number[a]	Aspen				Miscellaneous Hardwoods			
	Rough		Peeled		Rough		Peeled	
	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail
	(Dollars per cord)							
1-4[b]	14.50			21.00	15.50	14.00	21.00	21.00
5				19.00				
6[c]			19.50					
7-8[d]	17.50	16.00	20.50	19.00				
9[e]			19.50	18.00				
10[f]	14.50	13.00			15.50	14.00		
11[g]			20.50	19.00				
12[h]			20.00					
13[i]	14.00	13.00	20.00	19.00			20.50	19.50
14[j]	12.00		16.00					
15-16[k]	14.00		20.00		15.00			
17-18[l]	16.50	15.00	20.50	19.00				
19[m]	13.00		19.00		14.50		20.50	20.00
20[n]								
21[o]								
22-23[p]			21.00	20.00	15.00		16.50	
24			19.00	20.00				
25	12.00		19.00					

Mill number[a]	Spruce				Balsam fir			
	Rough		Peeled		Rough		Peeled	
	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail
	(Dollars per cord)							
1-4[b]	27.00	27.00	31.00	31.00	22.00	22.00	27.00	27.00
5		26.00				21.00		
6[c]								
7-8[d]	26.50	25.00			23.50	22.00		
9[e]	28.50	27.00	33.50	32.00	23.50	22.00	28.50	27.00
10[f]								
11[g]	28.50	27.00	33.50	32.00	23.50	22.00	28.50	27.00
12[h]					22.00	22.00		
13[i]	28.50	27.50	33.50	32.50	22.50	21.50	27.50	26.50
14[j]	27.00		31.00		22.00		26.00	
15-16[k]	28.00				23.00			
17-18[l]	29.00	27.50	35.00	33.50	24.00	22.50	30.00	28.50
19[m]	27.50	27.00	32.50	32.00	21.50	21.00	26.50	26.00
20[n]								
21[o]								
22-23[p]								
24								
25								

Table 40.--(Cont'd) Base prices paid for pulpwood by Wisconsin pulp mills, by species and method of delivery, 1959

Mill number[a]	Hemlock				Pine			
	Rough		Peeled		Rough		Peeled	
	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail
	(Dollars per cord)							
1-4[b]	20.00		25.00					
5								
6[c]								
7-8[d]								
9[e]								
10[f]								
11[g]								
12[h]								
13[i]								
14[j]	19.50	19.00	23.50	23.00				
15-16[k]	19.00							
17-18								
19[l]	18.00	17.00	23.00	22.00	18.00	17.50	23.00	22.50
20[m]								
21[n]						17.50		
22-23[o]					17.50	17.50		24.00
24[p]								
25								

[a]Four companies operate two or more plants in Wisconsin as separate establishments. Mills owned by one company are grouped since, in each case, the company pays the same prices at each of its mills.

[b]Commission of $1.00 added on dealer contracts. Spruce price lowered $1 and balsam price lowered $2 for f.o.b. rail purchases originating in Minnesota.

[c]$42.50 for peeled Canadian spruce delivered to mill by railroad.

[d]$1 added if trucking distance is over 50 miles. Commissions of $0.50, $1, and $1.50 added on dealer contracts.

[e]Commission of $0.50 to $1 added on dealer contracts.

[f]$0.50 added if trucking distance is 35 to 49 miles; $1 added from 50 to 64 miles; $1.50 added for distances 65 miles and over.

[g]Commissions of $0.50, $1, and $1.50 added on dealer contracts. $1.25 added if trucking is from Michigan. Peeled Canadian spruce delivered to the mill by rail is purchased at an average price of $41.50.

Footnotes for Table 40 (Cont'd)

[h]Commissions of $0.50, $1.00 and $1.50 added on large producer contracts. $42.00 for peeled spruce delivered to the mill by railroad.

[i]Bonuses of $0.50, $1, and $1.50 added on large producer contracts. $39.00 for peeled spruce and $38.00 for rough spruce delivered to mill by railroad.

[j]$1 added if trucking distance is over 50 miles.

[k]Commission of $1 added on dealer contracts.

[l]$1 added if trucking distance is 40-60 miles; $2 added above 40 miles. Commission of $1 added on dealer contracts.

[m]No prices given.

[n]Commission of $1 added on dealer contracts.

[o]$0.50 added beyond 36 miles; $0.50 added in each successive ring of townships up to $2.50 maximum. Commission of $1 added on dealer contracts.

[p]Spruce price lowered $1 and balsam price lowered $2 for f.o.b. rail purchases originating in Minnesota.

Table 41.--Base prices paid for pulpwood by sampled Minnesota pulp mills, by species and method of delivery, 1959[a]

Mill number	Aspen				Pine			Spruce		Balsam fir	
	Rough		Peeled		Rough		Peeled	Rough		Rough	
	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail	Truck to mill	Truck to mill	F.o.b. rail	Truck to mill	F.o.b. rail
	(Dollars per cord)										
1	9.00										
2									24.00		19.00
3	14.00	16.00						21.00	23.00	16.00	18.00
4[b]			18.00				18.40				
5[b]	13.20				17.48						
6			17.50		17.50						

[a]Truck to mill prices are base prices. They do not include unreported special bonuses to large producers or dealers.

[b]Pulpwood purchased by weight but is reported as a cord price on basis of standardized weight per cord of each species.

Table 42.--Base prices paid for rough pulpwood trucked to sampled Central States mills, by species and study area, 1959

Study area	Mixed hardwoods	Pine
	(Dollars per cord)[a]	
Ohio	12.80	
Indiana[b]	14.75	
Illinois		
Mill 1	12.37	
Mill 2	12.40	14.80
Iowa		
Mill 1	14.00	
Mill 2[c]	13.50	17.50
Missouri	11.96	

[a]Prices are reported in terms of the standard 128-cubic-foot-cord. One standard cord is equivalent to .8 of a long cord or unit, 4,500 pounds of soft hardwoods and 5,000 pounds of hard hardwoods or conifers.

[b]$0.75 added if trucking distance exceeds designated minimum distance. An additional $0.75 is paid for each of five successive distance zones.

[c]$1.25 bonus to Tree Farmers and producers who cut according to a forester's recommendations.

Price Competition Among Mills

Prices paid for pulpwood generally vary among the mills of a given study area, although some similarities can be noted in a few instances. However, the degree of similarity of dissimilarity is not easily seen. Prices listed in Tables 39 to 42 are "base" prices and do not necessarily reflect the prices paid or the actual costs to the mills.

A number of pulp companies pay special bonuses on large producer or dealer contracts. The size of these bonuses are footnoted to the tables.

Truck-to-mill prices can be particularly deceptive if one looks only at stated base prices. Seven of the mills sampled in Lower Michigan, eight in Wisconsin, and one in Indiana offer suppliers a "delivery bonus" for wood trucked to the mill yard from beyond a specified minimum distance. Delivery bonuses paid by the eight Wisconsin mills and one Indiana mill are footnoted in the price tables. Bonuses paid by Lower Michigan mills are not footnoted but shown in some detail in Table 43. Delivery bonuses are variable, so that the prices paid for trucked wood vary between mills much more than is reflected in the base prices listed in Tables 39 to 42.

F.o.b. rail prices are more standardized than prices for truck deliveries. Usually a pulp mill pays the same price for a particular species from all loading points from which it will accept pulpwood.[15]

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[15] Four Wisconsin mills which purchase f.o.b. rail at loading points in Minnesota and Wisconsin partially offset the higher costs of transportation from Minnesota by paying $1 to $2 less per cord for the Minnesota pulpwood.

Table 43.--Price bonuses added to the pulpwood base price for longer distances of truck haul paid by Lower Michigan pulp mills, 1959[a]

Distance of haul	Mill 1	Mill 4[b]	Mill 5	Mill 6[c]	Mill 7	Mill 8[d]	Mill 9
(Miles)	(Dollars per cord)						
0-25							
26-50			.50	.50			
51-75	1.00		1.00	1.00			.50
76-100			1.50	1.50			1.00
101-125			2.00	2.00			1.50
126-150			2.50	2.50			2.00
151-175				3.00			2.50
176-200				3.50			3.00
201-225							3.50
0-30							
31-45					.40	.50	
46-60					.80	1.00	
61-75					1.20	1.50	
76-100					1.60	2.00	
101-200					2.00	2.50	

[a]Unless otherwise noted, price bonuses apply to all species purchased.

[b]Bonuses offered, but data not available.

[c]Sliding price scale shown applies to peeled aspen. For pine, $1.50 is added if trucking distances are from 51 to 75 miles; $2.50 is added from 76 to 100 miles; $3.50, from 101-150 miles; and $4.50, over 150 miles.

[d]Sliding price scale shown applies to peeled aspen. For rough aspen, $0.50 is added if trucking distance is 31 to 45 miles; and $1 is added over 45 miles.

However, since transportation costs vary and these are paid by the mill, the total unit cost paid for rail wood varies by delivery points.

Prices in the Central States study area are variable, but price competition is not involved. For the most part, each mill operates in an isolated local timbershed. The price it offers for wood is determined by the relationship between its wood requirements and supply conditions in its timbershed. The price policy of one mill is not affected by the policy of another mill operating in a separate timbershed.

The situation is different for sampled mills in Lower Michigan and Minnesota in that there is more overlapping of supply areas in particular species. However, overlapping of supply area applies only to a portion of the pulpwood sought by an individual mill, and both standing timber and labor supply are generally plentiful. Under these circumstances, mills do not vie strongly with each other for wood supply. Some price leadership may be present, but it would be difficult to determine. The fact is, as Tables 39 and 41 indicate (together with the observations presented on various bonuses), substantial differences do show up in the prices paid by different mills for a given species.

In Wisconsin, timbersheds overlap to a large extent. Mills are clustered and must compete for local wood supply, particularly in the less plentiful species. Under these circumstances, it might be expected that prices would be fairly uniform. Some elements of price uniformity can be detected in Table 40, but in general, the variation in prices paid by different mills for a given species resembles that in other study areas of the region.

The comparisons by mills in the price tables do not throw much light on the competition among mills for wood supply, but there are other ways in which competition may be expressed easily offsetting small differences in price. Nonprice competition in pulpwood purchase is in such terms as these: financial, equipment, and other aids to suppliers; promptness of payment for delivered wood; and the size, duration and renewal of contracts.

Trucked-to-Mill and F.o.b. Rail Prices

Since rail-delivered wood is nearly always purchased f.o.b. railroad within the region and truck-delivered wood is purchased at the mill yard, the pulp companies assume an added cost in rail deliveries. Consequently, with one exception[16] a lower price is offered for rail purchase.

The price differential, as reflected in the price tables, is highly variable. Wisconsin mills, which use rail haul much more extensively than mills elsewhere in the region, generally hold to a differential of $1.50 per cord. In Lower Michigan, the differential may range up to $7 per cord, but despite the larger differentials here, another study has shown that in all cases of comparisons, railroad transportation costs the Michigan pulp mills more than the added distance bonuses to truckers for direct-to-mill deliveries (James and Lewis, 1960).

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[16] One Minnesota mill reported paying $2 more for wood delivered to designated railroad loading points than for truck deliveries to the mill.

Despite the transportation cost comparisons of the James and Lewis study, Lower Michigan pulp companies purchase nearly one-fourth of their wood requirements f.o.b. railroad. Obviously, some nonprice factors influence their willingness to accept more expensive deliveries. To some extent longer rail hauls are encouraged to spread out wood supply areas and thus avoid overcutting within short trucking radius of the mill. Decisions are also affected by the number of contracts the company is willing to negotiate, the advantage of maintaining supply channels from areas that may be needed for wood supply over the long run, and the comparative yard space and unloading facilities available for rail and truck deliveries. Delivery timing may also tend to favor some rail haul since a few, but not all, companies assume the rate of delivery can be better controlled by rail than by truck.

To pulpwood suppliers, the choice in terms of price received between delivery to railroad or directly to the mill is not always self-evident. In the common situation where the buyer pays an additional $1.50 per cord for truck-to-mill delivery over rail delivery, the supplier almost always gains by delivering to railroad. (There is an assumption here that truck haul to a loading point will average about 15 miles and will not exceed 30 miles.) It will not take many miles to eat up the $1.50 bonus for direct delivery to a mill. Where bonuses for truck delivery are scaled upward with greater distances, as in Lower Michigan, the producer's price comparison is variable. James and Lewis (1960) found that a seller located 5 to 10 miles from a rail loading point and 180 miles from a mill designated as "Mill A" faced an indifferent choice. At distances of less than 180 miles, he would

be better off to haul directly to the mill; at longer distances, to the rail loading point. However, if the same seller were to sell to "Mill B," the break-even point would be about 100 rather than 180 miles.

Variation in Prices by Species

Price variations by species are considerable. In each of the study areas, prices are lowest for aspen and other hardwood species. Pine averages about $5 per cord higher. Where used, balsam fir is several dollars higher than pine. And at the top of the price structure, some $4 to $5 higher than balsam fir, stands spruce. In all species, bark peeling adds to the price from $3 to $6 per cord.

These relationships are a result of economic forces operating on both the supply and demand side of the pulpwood market. On the supply side, price is affected primarily by the quantity of suitable timber and its location in respect to mill users, production costs, and the skill required of producers. Hardwood species are abundant throughout the region; they are accessible to all mills; and they frequently occur on sites which do not require special equipment or talents on the part of producers. Economically mature stands of pine are more restricted in location and are less abundant in relation to demand. Spruce and fir are relatively scarce species and they often occur on sites difficult to log. Since spruce and fir logging frequently requires special equipment and greater ability on the part of producers, higher prices are necessary to encourage production.

On the demand side, the unit value of paper products manufactured from various pulpwood species may also influence the prices

that pulp mills pay for these species. Other things being equal, the higher the value of the final product, the higher the price which can be paid for pulpwood. In this connection, Table 44 is illuminating. There is a great variation in value added by manufacture among the region's pulp mills, even for those mills using the same species. Nevertheless, the general pattern shows value added to be greater in softwood-using mills than in hardwood-using mills, and value added is usually highest in mills using spruce and fir. Spruce users may pay twice as much per cord of pulpwood as hardwood users, but in relation to value added by manufacture, the price may be similar.

Variation in Prices Over Time

A characteristic tendancy of pulpwood prices to exhibit sluggishness in changes over time has been noted elsewhere (James, 1957). This particular point cannot be checked by data obtained in this study, although a number of sampled producers complained about the failure of pulpwood prices to rise more rapidly over time. However, pulpwood price series published by various agencies in a number of states throughout the country reflect a tendency toward stability in prices. In the North Central region, published price series of more than a few years duration are available only for Wisconsin and Illinois.

Pulpwood prices for a number of species in Wisconsin and mixed hardwoods in Illinois are traced over a period of years in Table 45. In general, prices have been sticky, especially so during the period of 1952 to 1962. The pattern does not seem to be strongly affected by the degree of competition among pulp mills for wood supply. The relative

Table 44.--Value added by manufacture per cord of wood received and pulpwood price as a percent of value added by manufacture for sampled pulp mills, by study area, 1959

Mill number and study area	Principal species consumed	Value added by manufacture	Pulpwood price as a percent of value added by manufacture[a]
		(Dollars per cord)	
Michigan			
2	Aspen	126	9-10
3	Aspen	260	12-14
5	Aspen	99	13-14
6	Pine	329	5-6
7	Aspen	124	11-15
8	Spruce-fir	271	11-12
9	Aspen	95	21-23
Wisconsin			
1-4	Spruce-fir	392	7-8
5	Aspen	208	11-12
6	Aspen	74	27-30
7	Aspen	120	18-21
10	Aspen	207	7-8
11	Spruce-fir	257	11-12
13	Aspen	150	15-18
14	Aspen	136	15-16
15	Aspen-spruce	289	7-10
19	Pine	125	19-24
21	Pine	210	9-10
22-23	Aspen	187	10-11
24	Aspen	110	17-18
Minnesota			
1	Aspen	76	11-12
2	Spruce-fir	218	10-11
Iowa	Hardwoods	119	13-16

[a]Weighted average pulpwood prices calculated based on prices paid for wood trucked-to-mill, water-borne to mill, or delivered to railroad loading points. Where rail delivery is significant, especially to many Wisconsin mills, pulpwood costs to mills are higher than the prices used in these calculations.

Table 45.--Average prices per cord of rough pulpwood delivered to mills in Wisconsin and Illinois, by species and years

Year	Wisconsin[a]						Illinois[b]
	Aspen	Mixed hardwoods	Pine	Hemlock	Spruce	Balsam fir	Mixed hardwoods
	(Dollars per cord)						
1962	12.75	14.00	17.75	19.25	26.75	20.75	12.50
1961	13.00	13.75	18.00	19.00	26.75	21.75	12.25
1960	13.00	13.75	18.25	18.75	27.75	22.50	11.75
1959	13.00	13.50	18.75	18.75	27.75	22.50	11.50
1958	12.00	14.75	18.50	18.75	27.75	22.75	13.00
1957	13.00	14.75	17.75	18.75	27.75	22.75	12.00
1956	13.50	14.50	17.75	19.50	26.75	20.75	12.50
1955	12.75		17.50	18.25	25.75	20.75	12.50
1954	13.00		17.75	19.00	25.25	21.25	11.50
1953	13.00		17.50	16.25	22.75	20.75	
1952	13.00	12.50	18.00	16.25	25.75	21.50	
1951	15.00		18.25	17.75	26.00	18.75	
1950	10.50			14.50	20.50	17.50	
1949	10.25			14.25	19.50	16.50	

[a]Prices expressed on basis of truck deliveries to mills.

[b]Prices quoted at local delivery points. These would not always represent truck deliveries to mills.

Sources: Wisconsin data from Forest Products Price Review; Univ. of Wisconsin Extension Service, Madison, semiannual reports. Illinois data from Timber Prices, Illinois Cooperative Price Reporting Service, Springfield, periodic reports.

price movements are similar for species like spruce and fir which are relatively scarce and sought by a number of mills reaching into the same areas and for species like mixed hardwoods (both in Wisconsin and Illinois) which are so abundant that little, if any, competition among mills for wood supply is necessary.

One factor which limits price fluctuations is inherent in the method of purchasing. Most pulpwood is purchased under contract. Both oral and written contracts are used in which a pulp company commits itself to buy a specified volume over a specified period at a specified price. Contracts are usually negotiated several months in advance of the beginning of wood deliveries. The contract period itself is of variable length, but 6-month to 12-month contracts are not uncommon. Thus the pulp companies commit themselves in advance to a given price level which will hold for a period which may extend up to a year or more in length.

However, the major explanation for limited fluctuations in pulpwood prices rests in the behavior of stumpage prices which are highly variable. As logging costs vary (and they will vary as logging shifts from one group of forest stands to another group of stands), stumpage prices vary inversely, thus lessening market pressures on pulpwood prices to change. This point will be explained more fully in a later discussion of stumpage costs.

Effect of Intermediate Agent Roles on Pulpwood Prices

Dealers who function as agent middlemen are required to adhere to the price policies of pulp companies with which they have delivery

contracts. Recognized middlemen transmit price information between buyers and sellers, but other than acting in an advisory capacity, they have no control over the absolute prices paid to producers. Prices received by producers who sell through agent middlemen are those offered by pulp mills. As payment for their services, recognized middlemen are paid a commission of $0.50 to $1.50 per cord handled.

Merchant middlemen perform essentially the same marketing functions as agent middlemen but their special services are not recognized by pulp and paper companies. They are regarded as producers by the companies and receive the same price for delivered pulpwood as producers. In turn, merchant middlemen act independently of the price policies of pulp companies; they buy from producers at prices determined by their own negotiations with producers.

Producers who sell pulpwood to merchant middlemen receive a price below that offered by pulp mills or agent middlemen. The size of this differential is extremely variable and no meaningful average can be derived. The maximum price a merchant middleman will pay producers is very close to the price he receives from pulp companies. The minimum price he will pay is the minimum he can persuade a producer who has no alternative markets to accept.

Costs of Production

Operating in a highly competitive industry and supplying oligopolistic buyers, the pulpwood producer in the North Central region has virtually no control over the delivered price of pulpwood. The amount he is able to earn depends on his ability to hold down costs, not his ability to affect price.

In this section, costs of pulpwood production will be discussed by the principal categories--stumpage, logging (felling, bucking and skidding), and hauling.

Stumpage Costs

One of the cost items that appears to be most susceptible to the producers influence is stumpage. In the common situation where forest ownership is dispersed among numerous holders of small tracts, where owners sell stumpage infrequently and with inadequate knowledge of the volumes and values involved, and where more timber is available for sale than can be sold, buyers frequently hold the initiative and the market power. This is not the universal situation. Some owners of small tracts are better informed and better located geographically to permit bargaining with pulpwood buyers on more equal terms. Large landholders, particularly public agencies, are often able to negotiate stumpage sales on equal terms. But in general, stumpage buyers in the region have a bargaining position superior to that of stumpage sellers.

Unlike the situation with most commodities, costs of production have little effect on stumpage prices. Most stumpage is wild or volunteer growth. As such, it is established without cash outlay on the part of the landowner. Fixed costs faced by private landowners--taxes and interest charges--have to be paid whether stumpage is sold or not; they do not influence owners' decisions to sell at particular prices. Even public landowning agencies, which often assume costs of soil preparation, planting, protecting, and tending of forest stands, do not consider such costs in determining stumpage values.

Stumpage value is derived from "conversion return," which is the residual between the selling price of pulpwood and the costs of logging and hauling (Lewis and James, 1961). The conversion return includes both profit allowance (an estimated margin for profit, risk, interest on borrowed capital, and income taxes) and stumpage value. Imperfect knowledge on the part of both buyers and seller results in widely varying estimates of conversion return. Unequal bargaining abilities and local precedent result in different apportionments of conversion return into stumpage value and profit allowance.

Stumpage prices would vary greatly simply as a result of the abilities of buyers and sellers to estimate conversion return and break it down into stumpage value and profit allowance. An even more compelling influence is the infinite variation in forest conditions--species composition, volume per acre, size and quality of trees, location, accessibility, topography, and the costs of conversion.

Averages and range in pulpwood stumpage prices paid by sampled producers in 1959 are shown in Table 46. There is a wide range of price for each species in each study area.

In comparing species, it will be noted that the highest hardwood prices are below the lowest softwood prices. Aspen prices tend to be close to mixed hardwoods prices. Balsam fir prices tend to be higher than pine prices (except in Minnesota), and spruce prices are the highest of all. Stumpage price represents from less than 10 to more than 30 percent of the price of delivered pulpwood, but the percentage represented by stumpage is usually higher in the more expensive than in the cheaper species. In aspen, stumpage price averages 10 to 12 percent

Table 46.--Averages and range in pulpwood stumpage prices[a] paid for major species by sampled producers, by study area, 1959

	Aspen	Mixed hardwoods	Pine	Balsam fir	Spruce
			(Dollars per cord)		
Michigan:					
Average	1.34		3.46	3.79	4.69
Range	1.00 - 1.70		2.00 - 4.00	3.20 - 4.25	3.50 - 5.35
Wisconsin:					
Average	2.57	2.30	5.06	5.79	8.53
Range	1.00 - 3.00	0.75 - 3.00	3.65 - 5.75	4.50 - 7.00	7.00 -10.00
Minnesota:					
Average	1.05		2.89	2.57	4.41
Range	0.90 - 1.50		1.75 - 3.00	2.00 - 3.00	3.25 - 5.00
Central States:					
Average		2.03			
Range		0.80 - 3.75			

[a]For peeled wood, prices should be increased 15 percent.

of the delivered pulpwood price; in mixed hardwoods, the percentage is 15; in pine and balsam fir, 17; and in spruce, 25.

In comparing study areas, average stumpage prices range downward in the following order: Wisconsin, Lower Michigan, Minnesota. Central States prices reported by producers are also below Wisconsin prices, but there is no basis of comparison with prices in Lower Michigan and Minnesota. The general pattern of prices by study areas suggests the influence of the comparative bargaining powers of buyers and sellers.

The residual-value approach to stumpage prices is not merely a matter of theory. It is the approach used regularly by the U. S. Forest Service, the largest single seller of stumpage in the region. Other public agencies and private landowners tend to be guided by Forest Service timber sales (James and Lewis, 1961).

As the Forest Service approaches pulpwood stumpage pricing on any forest tract, it starts with the sale price of delivered pulpwood. The costs of logging and hauling are estimated and subtracted from the delivered price. Part of the margin between costs of logging and hauling and sale price is set aside as the proper allowance for profit and risk in the production process; what is left is stumpage value. This calculated stumpage value is the price insisted upon in negotiated sales, and it is the lowest acceptable price in cases where stumpage is sold on bid.

An important effect of the residual-value approach to stumpage prices is that it minimizes market pressures to change prices of delivered pulpwood. Since stumpage value is determined from the margin between estimated average logging and hauling costs and pulpwood sale

price, adding stumpage price to the other costs of production will result in a total which is the same as the delivered pulpwood price.

If logging and hauling costs increase in relation to delivered pulpwood price, the tendency is for stumpage price to fall accordingly. If the logging and hauling costs decrease, the tendency is for stumpage price to rise correspondingly. Stumpage acts as a cushion which absorbs the swings in other production costs. The result contributes heavily to a lack of frequent changes in delivered pulpwood prices.

The cushioning effect of stumpage is suggested in Figure 16 which summarizes price data published semiannually by the University of Wisconsin. Prices are shown only for the major pulpwood species (aspen), but the relationships are very similar to those applying to other species. The trends in both pulpwood prices and stumpage prices are very similar, but the short-term fluctuations are different. Stumpage prices fluctuate much more widely than pulpwood prices. They tend to vary inversely as typical production costs vary, thus minimizing the effect of other market pressures to change prices of delivered pulpwood.

Logging Costs

Logging, as used here, includes felling, limbing and bucking, bark peeling (when this is done), and skidding to roadside.

The methods by which logging operations are carried out, and costs calculated, are variable. In some cases, costs are calculated for the whole production operation, from the standing tree to roadside. In others, felling, limbing and bucking are considered a distinct operation, and costs are separate from skidding costs.

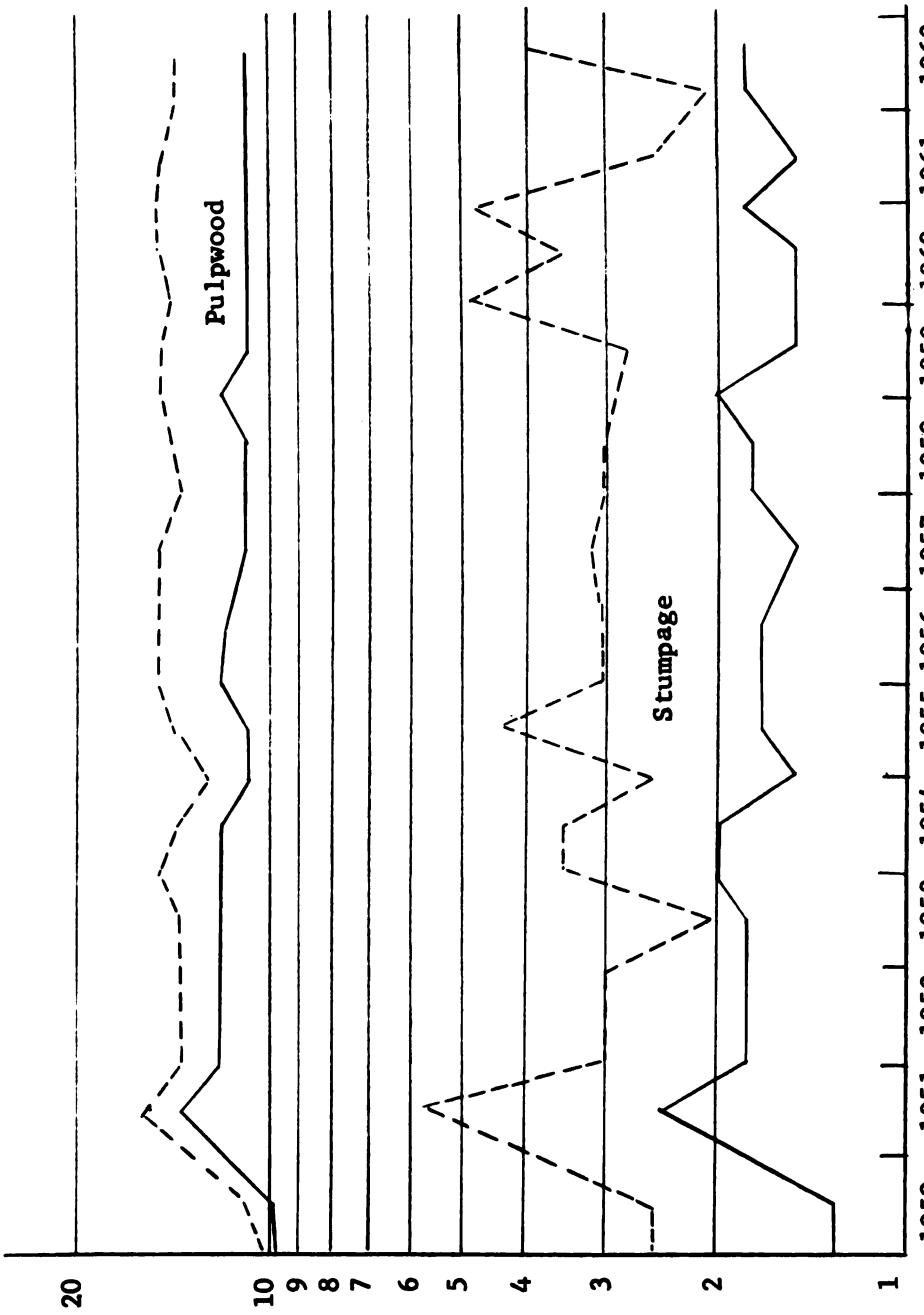

Fig. 16. Maximum and minimum prices in Wisconsin for aspen stumpage and rough pulpwood delivered to the mill, 1949-1962. (Source: Wisconsin Forest Products Price Review, Univ. Wisconsin Extension Service, Madison, semiannual reports.)

Data obtained from sampled producers show that pulpwood producers have a fair knowledge of total logging costs. However, unless different phases of the logging operation are subcontracted, producers do not explicitly attempt to distinguish costs attributable to different phases of the production process. Data collected were inadequate to permit separation of skidding from other logging costs.

Table 47 summarizes production costs as reported by sampled producers. The range is large within any one species and study areas. In species, the main distinction is between spruce-fir stands and all other species. Spruce-fir logging is fairly consistently higher cost logging. Geographically, logging costs appear to be highest in the Wisconsin study area.

Many factors contribute to the great variations in costs. In felling and bucking, costs reflect the wide differences in stands--differences in working conditions, number and size of merchantable trees, tree taper, limbiness, stand density, species composition, tree quality, volume per acre, and total volume in the stand. Skidding costs vary by type of equipment used, distance of skid, size and spacing of timber cut, and topography.

Other cost differences arise as a result of unit labor and machine costs. Again, road costs are necessary in some of the larger logging operations, and these may reach $1 or more per cord. Overhead costs, mainly for supervision, have little application to typical 1- and 2-man operations; but in larger operations, overhead may range up to $2 or more per cord (Lewis and James, 1961).

Table 47.--Logging costs[a] reported by sampled producers, by study area, 1959

	Aspen	Mixed hardwoods	Pine	Balsam fir	Spruce
			(Dollars per cord)		
Michigan:					
Average	5.81		6.22	8.55	8.55
Range	4.75 - 6.50		5.00 - 7.50	7.00 - 10.00	7.00 -10.00
Wisconsin:					
Average	6.22	7.00		9.11	9.30
Range	3.00 - 7.00	6.00 - 7.00		7.00 - 11.00	7.00 -11.00
Minnesota:					
Average	6.83		6.75	7.52	8.24
Range	5.00 - 8.00		5.00 - 11.50	7.00 - 11.50	7.00 -11.50
Central States:					
Average		5.05			
Range		2.50 - 8.00			

[a]Bark peeling, when done, is an additional cost item not shown in the table. It averages about $3.50 per cord in aspen, and $4.50 in spruce and fir.

Costs of workmen's compensation insurance represents another logging cost paid by some producers but not by others. Several of the Michigan and Wisconsin producers sampled report that insurance payments add from $1 to $2 per cord to production costs. Operators who employ fewer than two or three men (the specified number varies by state) and producers who subcontract logging operations are not legally required to carry workman's compensation insurance.

Hauling Costs

Hauling, as used here, refers to truck haul from roadside loading points to pulp mills or to railroad reloading points. Railroad transportation is not considered here because the cost does not comprise part of the suppliers' costs of production.[17]

Distance of direct truck haul to pulp mills is highly variable, depending on access to mills and company policy in encouraging longer truck hauls. In Wisconsin and the Central States study areas, distances above 50 miles are avoided (Table 48). In Minnesota, the median distance is 55 miles.[18] In Lower Michigan, where longer truck hauls are encouraged by sliding price scales, the median distance ranges from 70 miles in aspen to 200 miles for a small amount of spruce and fir.

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[17]Pulpwood produced within the region and delivered by rail is nearly always purchased at railroad loading points. The pulp company buyer pays the freight.

[18]This contrasts sharply with the 30-mile median truck haul distance reported by Minnesota pulp mills sampled, but is explained by the fact that many Minnesota producers sampled market their pulpwood in Wisconsin.

Table 48.--Median truck-to-mill and truck-to-railroad hauling distances reported by sampled producers, by species and study area, 1959

Species	Michigan		Wisconsin		Minnesota		Central States
	Mill	Rail	Mill	Rail	Mill	Rail	Mill
	(Miles)						
Aspen	70	15	35	13	53	19	
Mixed hardwoods							32
Pine	75	15	38	18	67	20	
Balsam)) Spruce)	200	25	31	17	48	21	

Distance of haul to rail loading points is much more limited. It is usually 10 to 20 miles, while the longer hauls do not often exceed 25 miles.

Producers haul pulpwood when they have their own trucks, but often, pulpwood hauling is contracted out to independent haulers at a stated rate per unit of volume. Contracted rates vary, depending on distance, road conditions, size and quality of trucks, bargaining abilities, and customary rate patterns within localities. Producers' estimates of hauling costs with their own trucks are affected by the same factors and, perhaps most important, their ability to judge their actual costs.

Many producers and part-time contract haulers do not understand the nature of fixed costs and often underestimate or exaggerate their costs of operation. For example, some producers report hauling charges for distances of less than 30 miles which are far in excess of those reported by most producers for hauls of 100 or more miles. Other producers, who apparently base their estimates on variable costs, report hauling costs for hauls of 50 to 70 miles which are lower than most producers report for distances of 30 miles or less. If the fixed costs are underestimated, operators frequently discover that when trucks have to be replaced, their out-of-pocket cost-accounting system has failed to provide adequately for such replacement. In the latter case, they may return to wage-earning occupations and their enterprises are taken over by new recruits eager to move from the wage earner to the independent operator role (James, 1957).

Reported truck-hauling charges (both contracted and noncontracted) are shown in Table 49. These are summarized by distances and study areas. For comparison, the rate schedule set up by formula in Lower Michigan by the largest pulpwood-buying mill and its chief contract carrier is also shown (James and Lewis, 1961).[19]

Reported hauling costs begin at $3.75 per cord for minimum-distance hauls and increase, roughly, to $4 at 20 miles, $5 at 50 miles, $7 at 90 miles, and $9 at 140 miles. This progression in costs is not uniform within each study area, and the shape of the cost curve varies by study area. These differences may reflect actual differences to some extent, but they also reflect differences in the understanding of costs, as noted previously. It is believed that the formula rates shown for Lower Michigan are a more accurate reflection of hauling costs in the region than those reported by sampled producers.

Hauling costs commonly represent from 12 to 35 percent of the delivered price of pulpwood. Because of their magnitude, these costs are frequently a determining influence on the decision to produce pulpwood in a given locality or stand of timber.

An indication of the impact of hauling costs on pulpwood operations is given in Table 50 which shows residual prices after deducting trucking costs (as indicated in the formula rates reported by James and Lewis, 1961) from delivered pulpwood prices at pulp mills in

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[19] In this schedule, the following formula rates apply:

Distance (miles)	Rate per mile per cord (dollars)
100 or less	0.065
101 to 150	0.055
over 150	0.049

Table 49.--Average truck-hauling costs for varying distances of haul reported by sampled producers, by study area, and costs established by formula in Lower Michigan, 1959

Distance in miles	Formula costs in Lower Michigan[a]	Hauling costs reported by producers[b]			
		Michigan	Wisconsin	Minnesota	Central States
		(Dollars per cord)			
10	3.00		3.75		
20	4.00	4.00	3.85	4.25	5.60
30	4.50	4.04		6.50	4.86
40	5.00		4.88		
50	5.00	5.33	4.91	5.00	4.79
60	5.00	6.20			
70	5.50	6.13	4.16	7.00	
80	5.50	6.01			
90	6.00	7.25		7.00	
100	6.25	7.01			
110	6.25				
120	6.60				
130	7.20				
140	7.70	9.00			

[a]When hauling is to railroad reloading points rather than to pulp mills, an average of $1 should be added to the charges shown to cover the additional costs of loading and unloading necessary to place pulpwood on rail cars. (Source: James, L.M. and Gordon D. Lewis. Transportation costs to pulpwood shippers in Lower Michigan, Mich. Agric. Expt. Sta., Quart. Bull. 42(3): 444-469. 1961.)

[b]Average hauling cost figures shown represent averages of reports by at least three producers. Michigan data based on reports of 51 producers; Wisconsin, 45; Minnesota, 38; and Central States, 18.

Table 50.--Residual prices left after deducting truck-hauling costs determined by formula from delivered pulpwood prices for rough aspen in Lower Michigan, by pulp mill, 1959

Hauling distance	Mill 1[a]	Mill 2	Mill 3[b]	Mill 4[c]	Mill 5	Mill 6[a]	Mill 7	Mill 8	Mill 9
(Miles)	(Dollars per cord)								
25	12.75	7.75			7.75	13.50	7.75	8.75	8.25
50	12.25	7.00			7.50	13.25	7.40	9.00	7.50
75	11.75	6.50			7.50	13.25	7.30	8.50	7.50
100	11.00	5.75			7.25	13.00	6.95	7.75	7.25
125	10.35	5.10			7.40	13.15	7.00	7.10	7.40
150	9.05	3.80			6.30	12.05	5.40	5.80	6.30
175	8.65	3.40			5.90	12.15	5.00	5.40	5.90
200	6.95	1.70			4.20	11.95	3.30	3.70	4.20

[a]Prices shown are for peeled aspen. Mill does not purchase rough aspen.

[b]Price data not given.

[c]Details of delivery bonuses paid not given.

Lower Michigan. These residuals indicate the amount available to cover stumpage costs, logging costs, and the margin for profit and risk.

Despite the fact that Lower Michigan mills offer price inducements for longer truck hauls to an extent not encountered elsewhere in the region, the residual prices shown in Table 50 decrease steadily for each 25 miles of hauling distance by $0.25 to $1.70 per cord.[20] The possibilities for profitable operations by producers decrease steadily with increasing distance (even where sliding price scales are used) except in those special instances where longer hauls are contracted out at rates below actual costs.

Comparison of Costs and Prices

Costs of production are compared with delivered pulpwood prices in Tables 51 and 52. Table 51 shows the comparison for pulpwood delivered to mill yards by truck, and Table 52, for pulpwood delivered to rail sidings and placed on cars. Data were inadequate for price-cost comparisons for pulpwood sold at other locations.

Margins shown in both tables should be interpreted with caution. Prices received are averages. They are weighted by bonuses which some mills pay but which all producers do not receive. Costs are also averages, reflecting stumpage purchases and contract rates. However, it is important to recognize that many producers use their own stumpage or their own labor and equipment in logging and hauling; their

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[20] There are two exceptions. In hauls to Mill 6, the residual price is calculated to be higher at 125 miles than at 100 miles. In hauls to Mill 8, the residual price is calculated to be higher at 50 miles than at 25 miles.

Table 51.--Margin and profit ratios for the production of pulpwood in the North Central region delivered to mills by trucks, by study area, 1959

Species	Price received[a]	Stumpage cost	Logging cost	Hauling cost	Margin	Profit ratio[b]
	(Dollars per cord)					(Percent)
Michigan						
Aspen						
rough	13.50	1.34	5.81	5.50	0.85	6
peeled	19.75	1.50	9.31	5.50	3.44	17
Pine	18.75	3.46	6.22	5.50	3.57	19
Spruce	32.00	4.69	8.55	9.80	8.96	28
Balsam fir	28.00	3.79	8.55	9.80	5.86	21
Mixed hdwds.	13.75					
Wisconsin						
Aspen						
rough	13.00	2.57	6.22	4.75	-0.54	
peeled	19.50	2.95	9.77	4.75	2.03	10
Pine	18.75	5.06	6.48[c]	5.00	2.21	12
Spruce	27.75	8.53	9.30	4.50	5.42	20
Balsam fir	22.50	5.79	9.11	4.50	3.10	13
Mixed hdwds.	13.50	2.30	7.00	4.25[d]	-0.05	
Minnesota						
Aspen						
rough	12.25	1.05	6.83	5.00	-0.63	
peeled	17.75	1.21	10.38	5.00	1.16	6
Pine	17.50	2.89	6.75	5.50	2.36	14
Spruce	23.25	4.41	8.24	5.00	5.60	24
Balsam fir	19.00	2.57	7.52	5.00	3.91	21
Central States						
Mixed hdwds.	13.11	1.87	5.05	4.50	1.69	13

[a]Unless otherwise noted, prices and costs are for unpeeled wood.

[b]Profit ratio is the ratio of the margin to price received.

[c]Sample data inadequate. Assume Michigan-Wisconsin average of $6.48.

[d]Sample data inadequate. Assume average hauling distance of 25 miles at a cost of $4.25.

Table 52.--Margins and profit ratios for the production of pulpwood in the North Central region delivered to railroad sidings, f.o.b., by study area, 1959

Species	Price received[a]	Stumpage cost	Logging cost	Hauling cost	Margin	Profit ratio[b]
	(Dollars per cord)					(Percent)
Michigan						
Aspen						
rough	12.50	1.34	5.81	4.50	0.85	7
peeled	17.50	1.50	9.31	4.50	2.19	12
Pine	18.00	3.46	6.22	4.50	3.82	21
Spruce	25.00	4.69	8.55	5.25	6.51	26
Balsam fir	21.00	3.79	8.55	5.25	3.41	16
Wisconsin						
Aspen						
rough	15.50	2.57	6.22	4.00	2.71	18
peeled	19.40	2.95	9.77	4.00	2.68	14
Pine	17.33	5.06	6.48[c]	5.00	0.79	5
Spruce	26.80	8.53	9.30	5.00	3.97	15
Balsam fir	21.75	5.79	9.11	5.00	1.85	8
Minnesota						
Aspen						
rough	10.75	1.05	6.83	5.00	-2.13	
peeled	16.25	1.21	10.38	5.00	-0.34	
Pine	16.00	2.89	6.75	5.00	1.36	8
Spruce	21.75	4.41	8.24	5.00	4.10	19
Balsam fir	17.50	2.57	7.52	5.00	2.41	14

[a]Unless otherwise noted, prices and costs are for unpeeled wood.

[b]Price ratio is the ratio of the margin to price received.

[c]Sample data inadequate. Assume Michigan-Wisconsin average of $6.48.

out-of-pocket expenses are low. Such producers often impute lower costs to their operations than if stumpage had to be purchased or logging and hauling contracted.

Despite these limitations, the margins shown indicate the relative profitability of handling different pulpwood species. For truck-delivered wood, the margins are consistently highest for spruce, followed in descending order by balsam fir, pine, peeled aspen, mixed hardwoods, and rough aspen. For pulpwood delivered to railroad, the margin relationships for different species are roughly similar except for a few deviations.

In a few cases, the calculated margins are negative--for trucked wood, rough hardwoods in Wisconsin and rough aspen in Minnesota; for rail wood, rough and peeled aspen in Minnesota. Some reservations apply to these calculations, particularly in the case of aspen moved by rail in Minnesota (data were limited and may not reflect average conditions). Nevertheless, comparisons of margins appear warranted. Spruce and fir are the most profitable species for producers in the Lake States. Rough aspen is clearly the least profitable species.

The last column in Tables 51 and 52 expresses the profit margin as a percentage of the price received for delivered wood. This measure of profitability--termed profit ratio--is often considered a more revealing measure of profits than is the absolute margin (Weintraub, 1958).

As in the case of margins, profit ratios should be interpreted with caution. There is sufficient reservation about the accuracy of the price and cost figures used to raise questions about the precision of

the profit ratios calculated. Moreover, we do not have sufficient experience to judge how satisfactory the various profit ratios are. What we can do, as in the case of margin calculations, is to draw comparisons of relative profitability.

By species, there is a general pattern in which some species yield higher profit ratios than other species; but it is not as clear-cut as in the case of calculated margins. Spruce usually yields the highest profit ratio in the Lake States, followed in descending order by balsam fir, pine, peeled aspen, and rough aspen. The striking exception is in rail deliveries in Wisconsin where profit ratios for aspen are relatively high. By method of delivery, profit ratios are generally higher for truck deliveries than for rail deliveries, again with the notable exception of aspen in Wisconsin. By study areas, no meaningful comparisons can be drawn.

Profitability also needs to be considered in terms of size of operations. The average profit margin of $2.50 per cord in the Lake States, representing a profit ratio of 14 percent, may appear to be an adequate return; but judged alongside the size of operations, profit is low. The average output of Lake States producers in 1959 was 153 cords which translates into a profit of $382. Average profit in the Central States was considerably lower. However, it must be remembered that the major returns obtained by pulpwood producers are not found in profits, but in payment for contributed labor, and secondarily, for contributed stumpage and the use of producers' equipment.

CHAPTER IX

CONCLUSIONS

Although the long-term trend in regional pulpwood consumption has been upward, pulpwood production has increased more rapidly. Increases in local forest inventories and improvements in wood pulping technology permitting a shift from softwoods to the more abundant and widespread hardwoods have increased the relative use of local timber and decreased mill dependence on imports. These shifts in wood sources, although by no means uniform throughout the region, have had considerable effect on all aspects of pulpwood marketing--size of wood supply areas, methods of transportation, wood procurement practices, delivery patterns and wood storage, and prices and costs.

Size of Wood Supply Areas

Central States mills draw their wood supplies from relatively small, localized timbersheds. They reach average distances ranging from 20 to 100 miles, depending primarily upon the volume of wood consumed. Lake States mills draw their wood supplies from considerably larger timbersheds. Sampled Minnesota mills reach out an average of 108 miles; Michigan mills, 236 miles; and Wisconsin mills, 475 miles.

Obviously, the preference of pulp companies is for small, localized timbersheds, but mill size, nearness of competing mills, location of forest resources, and species requirements dictate different policies in regard to procurement territories.

Another factor of significance is in considerations of the short term versus the long term. Crop trees take many years to grow. Pulpwood procurement which ignores the need to replace timber stands through the slow growth process could exhaust timber supplies close to the mill and force enlargement of supply areas over time. However, most companies in the region are cognizant of this problem. The fact that forest inventories are increasing while many timbersheds are decreasing in size is evidence that timbersheds have not generally become overly constricted in size. Again, nearly all Lower Michigan mills and many Wisconsin mills offer price bonuses for wood trucked in over longer distances. Such sliding price scales are geared, at least in part, to the desire to spread cutting operations out over large areas so as to avoid local forest depletion.

Methods of Transportation

Truck and rail are the principal means of transporting pulpwood from wood supply areas to pulp mills. In the Central States, where maximum hauls seldom exceed 100 miles, nearly all transportation is by truck. In the Lake States, 59 percent of the pulpwood is moved to mills by rail, 38 percent by truck, and 4 percent by water.

Distance of haul has a considerable influence on method of transportation. From the point of view of the pulp companies, trucking is cheaper where hauls are short, rail is cheaper where hauls are long.

The break-even point is highly variable, but as a generalization, it can be placed in the vicinity of 100 miles. From the point of view of the pulpwood supplier, faced with the typical bonus of $1.50 per cord for direct delivery to the pulp mill and an average distance of 15 miles to a rail loading point, direct truck delivery to the mill will usually be more profitable up to a distance of about 100 miles. With increasing price bonuses for longer truck hauls, as is characteristic in Lower Michigan, break-even distances may move out to 200 miles.

The percentage of wood moved to mills by truck has been increasing. This process has been facilitated by the increasing use of price bonuses for longer truck hauls, the increasing tendency of pulp companies to deal directly with producers rather than intermediate agents, and the tendency toward shrinkage in wood supply areas with the broadening in species use. The process may be expected to continue because of economies in cost. Many rail hauls being used are more expensive to pulp companies than truck hauls from the same area. However, rail transportation will continue to be used by Lake States mills, not only because it is cheaper for long hauls, but because it offers some non-price advantages in intermediate-distance hauls where rail transport may be more expensive than truck. To some extent longer rail hauls are encouraged to spread out wood supply areas and thus avoid over-cutting within short trucking radius of the mill. Decisions are also affected by the number of contracts a company is willing to negotiate (intermediate agents with large contracts usually prefer to ship by rail), the advantage of maintaining supply channels from areas that may be needed for wood supply over the long run, and the comparative yard

space and unloading facilities for rail and truck deliveries. Some companies also assume that the rate of pulpwood delivery can be better controlled by rail than by truck.

Wood Procurement Practices

Sampled Lake States mills obtained 57 percent of their 1959 pulpwood supplies from producers, 26 percent from intermediate market agents, and 16 percent from company logging operations or contract cutters. Central States mills purchased mainly from producers; only 14 percent of their total receipts were obtained from intermediate agents.

The procurement system relied on most heavily is one of direct purchase from pulpwood producers. Moreover, the region's pulp companies have been increasing the percentage of wood receipts obtained by this system. The percentage of receipts obtained from dealers (intermediate agents) has been decreasing, as has the percentage obtained from company logging operations or contract cutters.

The gradual shift from company operations is readily understood. Such operations require more planning, supervision and actual management on the part of wood procurement staffs. They also place more responsibility on the pulp companies for adherence to workmen's compensation insurance, Social Security, and other labor laws. Moreover, it is doubtful that many companies can produce pulpwood as cheaply as independent producers are willing to produce it.

The shift in purchases from dealers to producers is not as readily understood. The dealer system simplifies wood procurement.

The average dealer contract in the Lake States is for 2,300 cords. (It could be much larger except that most companies using dealers prefer to have dealers contract with a number of companies.) In contrast, the average producer contract is for 153 cords. Thus, in working with dealers, pulp companies greatly reduce the number of agreements that need to be negotiated and coordinated. Dealers assume the responsibility for farming out their contracts to a number of producers. They generally offer loans to producers in advance of deliveries. They assume some responsibility either in providing stumpage or aiding the producer to locate stumpage. Some dealers assist producers in financing equipment purchases. Other forms of aid often include the furnishing of technical advice on methods of pulpwood production, assistance in finding markets for timber products other than pulpwood, and posting of market supply and demand conditions.

One type of dealer is the merchant middleman who is not recognized as a dealer by pulp companies. He receives the producer price for delivered wood, but obtains remuneration for his services by purchasing from producers at lower prices. Since he is, in effect, merely a producer to the pulp company, there is no recognizable policy of encouraging or discouraging his role.

The more significant intermediate agent role is that of the agent middleman who acts as a broker or commission agent. Agent middlemen account for 85 percent of the wood handled by dealers. They do not actually take title to the pulpwood they handle, but receive a commission for their services from the pulp companies ranging from $0.50 to $1.50 per cord.

The agent middleman's average charge of $1 per cord for his services cannot be viewed as excessive. His services eliminate a major portion of the purchasing costs on the part of the pulp companies. Pulp companies relying on dealers exclusively report nominal purchasing costs other than the commissions paid. In contrast, companies buying exclusively or mainly from producers report purchasing costs ranging up to $2.40 per cord, and averaging about $2. Thus, it appears that the agent middleman system can often supply pulpwood to mills at lower total cost than a system of direct purchase from producers, thereby lowering the overall cost of pulpwood marketing.

In view of the comparative costs, it is worth considering the possible advantages pulp companies gain by eliminating middlemen. One advantage is in the increased ability of a company to locate cutting operations in such a pattern as to more effectively regulate the sustained-yield capacity of a supply area. This has some value to a company which does not encounter much intermill competition within its timbershed. Another advantage claimed by some companies is that the procurement staffs which need to be built to handle the many producer contracts can be used in slack periods to engage in public relations work and the offering of forest management assistance to small landowners. Again, there may be a gain of flexibility in regulating the flow of pulpwood to mill yards. Another possible advantage, not generally claimed, is that the bargaining position of the pulp companies is stronger when dealing with large numbers of small producers rather than a more restricted group of economically stronger dealers.

Advantages and disadvantages of direct producer contracts need to be weighed against those of the dealer system. One system or the other may appear to have the advantage in the framework of each company's appraisal. No clear-cut generalization can be made, but in terms of short-run wood procurement costs, the advantage usually lies with the dealer system.

An aspect of procurement practices that needs much more attention is the size and duration of producer contracts. The average number of cords per producer contract is 153 in the Lake States, 210 in the Central States. These are small contracts which, even under conditions of continuity in contract renewal, would yield small returns. Gross sales value of the pulpwood produced averages about $2700 per producer both in the Lake States and Central States. The return in profit and labor wage might be less than half this figure. Despite the lack of precision in the calculations, it is clear that the average contract is too small to employ a producer gainfully throughout the year.

About 60 percent of the producers are part-time operators. As wage earners, farmers or other kinds of workers who engage in timber production on a part-time basis, they may prefer part-time employment in the pulpwood industry. On the other hand, some 40 percent of the pulpwood producers depend on timber production for their full livelihood. Too many of them, as well as too many of the currently part-time producers, inability to obtain larger contracts is a chronic grievance. Larger contracts are needed to lower the unit costs of the machines and equipment required for efficient production,

to hold a stable, efficient labor force, and to raise the economic level of those engaged in pulpwood production.

Related to the greater need for contracts large enough to permit efficient operators to achieve economies of scale and adequate earnings is the need for more stable operations. Seasonality in pulpwood production and deliveries caused by adverse weather conditions and temporary highway weight restrictions is, at least to some extent, unavoidable. The widespread practice of concentrating purchase activities during those periods of the year when rural labor is unemployed also produces seasonal swings in production and deliveries. Pulp company procurement and inventory policies which are independent of natural forces and the availability of woods labor also prevents stabilization of producer operations. Procurement policies tied to policies of having a minimum level of inventories on hand at the time of property tax assessment or of maintaining small stockpiles of wood by regulating purchasing activities in accord with short-term fluctuations in pulp mill wood requirements compound the problems of the full-time heavily capitalized producer. Such producers require stability of operations to maintain low per cord production costs by continuous employment of machines and equipment.

There is also a need for more stable operations over a period of years. An efficient, dependable woods labor force cannot be built and held if drastic changes in contracts are made from year to year. Such changes are a common complaint. They are understandable in terms of pulp company needs to adjust wood supply to fluctuations in their product markets, but it might be possible for the pulp companies to

gain more stability in production for at least the full-time segment of the producer populations. This might be accomplished by such means as a greater willingness to stockpile pulpwood, or by compensating for year to year fluctuations in wood requirements by varying the volume of purchases from seasonal producers.

Prices and Costs

In comparing average costs and prices, it has been noted that producers' profit margins per cord of pulpwood appear to be generally adequate. The margins are greatest for those species which are relatively scarce or more difficult to log; margins are least for the more abundant species and those which can be logged on a part-time, nonspecialized basis.

Obviously, all producers would like to receive higher prices for pulpwood which would increase the profit margins to them. However, this is not the basic problem in the industry. Large-scale, specialized producers with stable contracts often point out that existing pulpwood prices do not pose special problems. Their earnings are more dependent on their ability to obtain full and efficient use of machinery and labor employed through volume production on a full-time basis.

There is a widespread surplus both of timber growing stock and labor in the pulpwood-producting areas of the region. Under conditions of present pulpwood producing technology the productive capacity of producers who are willing to produce pulpwood under existing price patterns is excessive relative to demand. This is apparent both from

the interviews with pulp companies and with producers. In light of this excess supply, it is quite likely that some pulp companies could reduce prices paid and still meet mill requirements for wood, at least in the short run.

Present policies which lead to widespread use of seasonal, part-time pulpwood producers can be viewed in one sense as socially desirable in that they offer some earnings to a great many rural workers. In another sense, such policies contribute to the redundancy and underemployment of labor and capital in the pulpwood-producing regions. They may provide income which, when added to that available from other marginal forms of employment, is enough to hold an abundance of low-income labor in the area. The primary need is for the transfer of redundant capital and labor to other, more productive uses.

It might be better long-run policy for the pulp companies to limit the number of pulpwood contracts to a more restricted number of producers and to assist these producers to lower costs through the use of the most efficient machines and equipment and to attain attractive, stable income levels through large-scale, sustained production. Whether such a policy will lead to a more socially desirable use of resources is difficult to determine. The ability of the small, part-time producer who would be displaced by such a policy to find more socially productive employment will depend upon his abilities and skills and economic conditions exogenous to the pulpwood industry.

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APPENDIX A. PRIMARY MANUFACTURER SCHEDULE

CONFIDENTIAL

Form No. 1

Date _____
Recorder _____
State _____

NCM-27 Project

PRIMARY MANUFACTURER

Name of firm _____

Address _____

A. General:

1. Do you process logs or bolts in your mill? Yes ____ No ____

2. How many years has your firm been operating at this location?
_____ years.

3. Does your firm operate other wood-using mills?
Yes ____ No ____
If YES, how many? _____
If YES, how many in the study area? _____

4. Is your firm engaged full time in the processing of timber products? Yes ____ No ____
If NO, what other business or occupation is your firm engaged in? (specify) _____
If NO, what percentage of your firm's gross revenues in 1959 was realized from the sale of forest products?
_____ percent.

5. What were the principal products of your firm at this location in 1959?
a. _____ d. _____
b. _____ e. _____
c. _____ f. _____

6. How many full-time employees did you have at this location in 1959? _____

7. How many seasonal employees did you have at this location in 1959? _____

B. Quantities of wood receipts: (Volume by _____ log rule.)

1. What was the total volume of wood receipts at your mill in 1959? (List by species, raw product, peeled or unpeeled, and units of measure.)

_____
_____
_____

2. What was the monthly pattern in volume of wood receipts at your mill in 1959? (If monthly data are not available, indicate peak-and low-use months and amounts.)

Jan.	_____	July	_____
Feb.	_____	Aug.	_____
Mar.	_____	Sept.	_____
April	_____	Oct.	_____
May	_____	Nov.	_____
June	_____	Dec.	_____

3. Do you consider the monthly pattern in volume of wood receipts at your mill in 1959 to be a typical pattern? Yes ____ No ____
   If NO, why not? _____
   _____

4. Do you prefer seasonal variations in the volume of wood receipts at your mill? Yes ____ No ____
   If YES, what is your preferred pattern of receipts?
   _____
   _____

5. How do you explain the seasonal variations in the typical pattern of wood receipts at your mill? _____
   _____
   _____

6. Were any of your wood receipts in 1959 resold in the same form in which they were received? Yes ____ No ____
   If YES, what species and amounts? _____
   _____
   If YES, why was this wood not processed at your mill?
   _____
   _____

7. What changes in the annual volume of wood receipts at your mill took place in the years 1950-59? (List by species)

Year	All species					
1959						
1958						
1957						
1956						
1955						
1954						
1953						
1952						
1951						
1950						

8. Did your mill do any custom processing of timber products in 1959? Yes ____ No ____
   If YES, what species, products, and amounts? _____
   _____
   _____
   If YES, did you receive as payment a portion of the wood processed? Yes ____ No ____
   If YES, what percentage? _____ percent.

C. Inventories of raw wood:

1. What was the monthly pattern in raw wood inventories on hand at your mill in 1959? (If monthly data are not available, indicate peak-and low-inventory months and amounts.)

Jan.	_____	July	_____
Feb.	_____	Aug.	_____
Mar.	_____	Sept.	_____
April	_____	Oct.	_____
May	_____	Nov.	_____
June	_____	Dec.	_____

2. Do you consider the monthly pattern in raw wood inventories at your mill in 1959 to be a typical pattern? Yes ____ No ____
   If NO, why not? _____
   _____

3. Do you prefer seasonal variations in the volume of raw wood inventories on hand at your mill? Yes ____ No ____

   If YES, what is your preferred pattern of inventories?
   _____
   _____
   If NO, do you have an objective of maintaining a fixed ratio in the volume of raw wood inventories to annual receipts? Yes ____ No ____
   If YES, what is this ratio? _____

   If NO, do you have an objective of maintaining a fixed ratio in the volume of raw wood inventories to annual manufactured product sales? Yes ____ No ____
   If YES, what is this ratio? _____

4. Is there a physical limit to the volume of raw wood inventories that can be stored in yard economically? Yes ____ No ____
   If YES, what is the nature of the limitation? _____
   _____
   _____
   If YES, what is the maximum volume? _____

5. Is there a technological limit to the volume of raw wood inventories that can be stored in yard because of insects, fungi, etc.? Yes ____ No ____

   If YES, what is the nature of the limitation? _____

   _____

   _____

   If YES, what is the maximum volume? _____

D. Sources of wood receipts:

1. Where is the 1959 wood supply area for your mill? (List counties or states if only a few are involved. Outline on attached county map, if possible. State radius of operations in miles.)
   a. Counties or states. _____

   _____

   b. Radius of operations. _____

2. Have there been any significant changes in the wood supply area for your mill over the period 1950-1959? Yes ____ No ____
   If YES, what were the changes? _____

   _____

   _____

3. What is the ownership of the forest land from which the 1959 wood supply was obtained? (Estimate volume of wood or percentage of total volume obtained from each source.)

	Volume	%		Volume	%
a. Own land*			d. Nat. forest		
b. Farmer			e. State forest		
c. Other private			f. Other public		

*Include subsidiary company ownership

4. Have there been any significant changes in the wood supply obtained from different forest landownership sources over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

   _____

   _____

   If YES, what explanations can you give for these changes? __

   _____

   _____

5. From which agent sources was your 1959 wood supply obtained? (Estimate volume of wood or percentage of total volume obtained from each source.)

	Volume	%
a. Own employees:		
(1) From own lands		
(2) From other lands		
b. Producer		
c. Dealer		
d. Other agent (specify) _____		

6. Have there been any significant changes in the agent sources of your wood supply over the period 1950-59? Yes ____ No ____

If YES, what were the changes? _____

_____

_____

If YES, what explanations can you give for these changes? __

_____

_____

E. Wood procurement methods and policies:

1. What percentages of your firm's 1959 cut wood purchases were obtained under the following types of agreements? %

a. Written contract _____
b. Oral contract _____
c. No prior agreement _____

QUESTIONS 2 TO 6 APPLY ONLY TO WRITTEN CONTRACTS FOR CUT WOOD PURCHASES. IF THERE WERE NO SUCH CONTRACTS, SKIP TO QUESTION 7.

2. How far in advance of the beginning of wood deliveries are contracts usually negotiated? _____

_____

3. What are the details of standard written contracts for cut wood purchase? (Obtain printed copies where possible. Check the following items which are included in contract specifications; then describe as much as possible.)

a. _____ Kind of wood _____
b. _____ Amount of wood _____
c. _____ Size of wood _____
d. _____ Quality of wood _____
e. _____ Time or period of delivery _____
f. _____ Method of payment _____
g. _____ Time of payment _____

4. Are there any differences in the cut wood purchase contracts made with different groups of agents? Yes ____ No ____

If YES, what are these differences? _____

_____

5. Does the standard cut wood purchase contract specify any conditions under which timber is to be harvested?

Yes ____ No ____

If YES, what are the conditions? _____

_____

6. How binding are the provisions of standard written contracts for cut wood purchases (i.e., how much leeway is given suppliers in completing terms of contract and how much leeway does your firm allow itself in terminating contracts)? _____

_____

_____

_____

QUESTIONS 7 TO 11 APPLY ONLY TO ORAL CONTRACTS FOR CUT WOOD PURCHASES. IF THERE WERE NO SUCH CONTRACTS, SKIP TO QUESTION 12.

7. How far in advance of the beginning of wood deliveries are contracts usually negotiated? _____

_____

8. What are the details of oral contracts for cut wood purchases? (Check the following items which are included in agreements; then describe as much as possible.)

a. _____ Kind of wood _____
b. _____ Amount of wood _____
c. _____ Size of wood _____
d. _____ Quality of wood _____
e. _____ Time or period of delivery _____
f. _____ Method of payment _____
g. _____ Time of payment _____

9. Are there any differences in the oral contracts for cut wood purchases made with different groups of agents?

Yes ____ No ____

If YES, what are these differences? _____

_____

_____

10. Does the oral contract for cut wood purchases specify any conditions under which timber is to be harvested?

Yes ____ No ____

If YES, what are the conditions? _____

_____

11. How binding are the provisions of oral contracts for cut wood purchases (i.e., how much leeway is given suppliers in completing terms of contract and how much leeway does your firm allow itself in terminating contracts?)

_____

_____

_____

QUESTIONS 12 TO 16 APPLY ONLY TO STUMPAGE PURCHASES BY YOUR FIRM. IF NO STUMPAGE PURCHASES ARE MADE, SKIP TO QUESTION 17.

12. What percentages of your firm's 1959 stumpage purchases (in terms of volume) were obtained under the following types of agreements?

	%
a. Written contract with public landowners	_____
b. Written contract with private landowners	_____
c. Oral contract	_____

13. What are the details of your firm's standard contracts for stumpage purchases from private landowners? (Check the following items which are included in agreements; then describe as much as possible.)

a. _____ Species _____
b. _____ Amount of timber _____
c. _____ Size of timber _____
d. _____ Quality of timber _____
e. _____ Time or period of harvest _____
f. _____ Method of payment _____
g. _____ Time and basis of measurement _____

14. If the standard contract for stumpage purchases from private landowners is a written contract, and if oral contracts are also made, how does the oral contract differ in its provisions from the written contract? _____

_____

_____

15. Are there any differences in the stumpage purchase contracts made with different groups of private landowners?

Yes ____ No ____

If YES, what are these differences? _____

_____

_____

16. Does the standard contract for stumpage purchases from private landowners specify any conditions under which timber is to be harvested?

Yes ____ No ____

If YES, to what percentage of your 1959 private purchases do these specifications apply? _____ percent.

If YES, what are the specifications? _____

_____

_____

If NO, are there any harvest conditions your firm will accept in contracts for stumpage purchases upon a private landowner's insistence?

Yes ____ No ____

If YES, what are the conditions? _____

_____

17. What percentages of your 1959 wood purchases were obtained through negotiations initiated by your firm or initiated by sellers?

	%
a. Mill	_____
b. Sellers	_____
c. Indefinite	_____

18. When your firm takes the initiative in negotiating wood purchases, what are the methods you use in contacting potential suppliers? _____

_____

_____

19. From how many different persons or agencies was your 1959 wood supply purchased?

	No.		No.
a. Nonproducer landowner	_____	c. Dealer	_____
b. Producer	_____	d. Other agent (specify)_____	_____

Was 1959 a typical year? Yes ____ No ____

If NO, why not? _____

_____

_____

20. What quantities of your 1959 raw wood receipts were purchased on the stump, roadside, and delivered?

	Quantity	%
On the stump	_____	
Roadside	_____	
F.o.b. railroad	_____	
Delivered to mill	_____	

21. Did the points of purchase of 1959 raw wood receipts vary by agent sources of wood? Yes ____ No ____

If YES, how did they differ? _____

_____

_____

22. To what degree does your firm perform the following functions in regard to wood procurement?

a. Logging? _____
b. Hauling? _____

QUESTIONS 23 AND 24 APPLY ONLY TO CUT WOOD PURCHASES FROM PRODUCERS.

23. Are any producers offered payments (loans) in advance of time of payment specified in a standard contract? Yes ____ No ____

If YES, is this the usual procedure adopted by your firm? Yes ____ No ____
If YES, does the producer pay interest on such prepayments or loans? Yes ____ No ____
If YES, what is the size limitation on the prepayments or loans offered? _____

_____

24. Are any producers offered other business aids by your firm? Yes ____ No ____
If YES, is this the usual procedure adopted by your firm? Yes ____ No ____
If YES, what are these business aids? _____

_____

_____

QUESTIONS 25 AND 26 APPLY ONLY TO CUT WOOD PURCHASES FROM DEALERS OR EQUIVALENT AGENTS.

25. Are any dealers offered payments (loans) in advance of time or payment specified in standard contract? Yes ____ No ____

If YES, is this the usual procedure adopted by your firm? Yes ____ No ____
If YES, does the dealer pay interest on such prepayments or loans? Yes ____ No ____
If YES, what is the size limitation on the prepayments or loans offered? _____

_____

26. Are any dealers offered other business aids by your firm? Yes ____ No ____

If YES, is this the usual procedure adopted by your firm? Yes ____ No ____
If YES, what are these business aids? _____

_____

_____

27. Do you assign exclusive procurement territories to your wood suppliers? Yes ____ No ____

If NO, what policy do you follow to minimize the overlapping of procurement territories by your wood suppliers? _____

_____

_____

28. Do you object to having your wood suppliers take contracts to supply wood to other firms using the same kind of timber? Yes ____ No ____

If YES, what action do you take? _____

_____

29. Do you have any wood procurement policy designed to minimize wide fluctuations in the volume of wood called for in successive contracts made with suppliers? Yes ____ No ____

If YES, explain what this policy is. _____

_____

_____

F. Prices:

1. What prices were paid per unit of volume (price scale at end of 1959) for wood purchases by your firm? (Fill in as many items as possible, by species, product, and quality classes.)

	Species, product, and quality classes		
a. Stumpage			
b. Roadside			
c. Delivered to rr.			
d. F.o.b. rr.			
e. Trucked at yard			
f. Rr. at yard			

2. Are there any differences in the prices paid to different groups of landowners or agents? Yes ____ No ____

If YES, what are these differences (and which prices are quoted in item 1 above)? _____

_____

_____

3. Are there any differences in prices paid for delivered wood on basis of distance of haul? Yes ____ No ____

If YES, what are these differences by mode of transportation (and which distances do the prices quoted in Item 1 above refer to)? _____

_____

_____

4. Are the prices you pay for wood raw material the result of: (Check the correct explanation below)

a. _____ your offered price? c. _____ negotiation?
b. _____ the seller's price? d. _____ other (specify) _____?

5. Are the prices received for your principal products sold the result of: (Check the correct explanation below)

a. _____ your price? c. _____ negotiation?
b. _____ the buyer's price? d. _____ other (specify) _____?

6. What prices per unit of volume were obtained by your firm at the end of 1959 for the processed products you sold? (List by principal products.)

_____

_____

_____

7. How frequently have the prices you pay for wood raw material changed during the 3-year period 1957-59? _____ times.

8. How frequently have the prices received for the principal products sold by your firm changed during the 3-year period 1957-59? _____ times.

G. Costs:

1. What logging costs (felling and bucking and skidding) per unit of volume applied to wood products delivered to your mill at the end of 1959? (Estimate prevailing contract rates, if logging costs were not paid for directly by your firm.) ___

_____

_____

2. What truck hauling costs per unit of volume applied to wood products delivered to your mill at the end of 1959? (Estimate prevailing contract rates, if hauling costs were not paid for directly by your firm.)

   a. Hauling by truck direct to mill.
      (1) Average cost? _____
      (2) Min. cost? _____
      (3) Max. cost? _____
      (4) Cost by distance zones? _____
   b. Hauling by truck to railroad.
      (1) Average cost? _____
      (2) Min. cost? _____
      (3) Max. cost? _____
      (4) Cost by distance zones? _____

3. Do truck hauling costs above include the cost of loading? Yes ____ No ____
   If NO, what is the estimated loading cost per unit of volume? _____
   If NO, who pays the cost of loading? _____

4. Do truck hauling costs direct to mill include the cost of unloading? Yes ____ No ____
   If NO, what is the estimated unloading cost per unit of volume? _____
   If NO, who pays the cost of unloading? _____

_____

5. Do truck hauling costs to railroad include the cost of unloading and loading onto railroad cars? Yes ____ No ____

   If NO, what is the estimated cost per unit of volume? _____

   _____

   If NO, who pays this cost? _____

   _____

6. What railroad hauling costs per unit of volume applied to wood products delivered to your mill at the end of 1959?

   a. Average cost? _____
   b. Min. cost? _____
   c. Max. cost? _____
   d. Cost by distance zones? _____

7. What was your cost per unit of volume for wood purchasing activities in 1959?

   _____

H. Transportation:

1. What percentages of the volume of your raw wood receipts in 1959 were delivered to your mill by different methods of transportation?

	%
a. Truck	_____
b. Railroad	_____
c. Other (specify) _____	_____

2. What were the truck-hauling distances to your mill in 1959 in direct-to-mill wood hauls?

	Miles
a. Average distance	_____
b. Min. distance	_____
c. Max. distance	_____

3. What were the truck-hauling distances to railroad in 1959 in wood hauls where deliveries to your mill was by railroad?

	Miles
a. Average distance	_____
b. Min. distance	_____
c. Max. distance	_____

4. What were the railroad-hauling distances to your mill in 1959 in wood hauls where deliveries to your mill was by railroad?

	Miles
a. Average distance	_____
b. Min. distance	_____
c. Max. distance	_____

5. What changes in the use of different methods of transportation for deliveries of raw wood to your mill have occurred over the period 1950-59? _____

_____

_____

6. What changes in the distances of haul for deliveries of raw wood to your mill have occurred over the period 1950-59?

   a. Truck deliveries? _____

   _____

   b. Railroad deliveries? _____

   _____

I. Sales of processed products:

1. What was the total volume of production at your mill in 1959? (List by products.) _____

   _____

2. What percentage of mill capacity did your 1959 production represent? _____ percent.

3. What was the gross sales value of processed products at the mill in 1959? _____

4. What was the monthly pattern of production at your mill in 1959 (in terms of volume)? (If monthly data are not available, indicate peak-and low-production months and amounts.)

Jan.	_____	July	_____
Feb.	_____	Aug.	_____
Mar.	_____	Sept.	_____
April	_____	Oct.	_____
May	_____	Nov.	_____
June	_____	Dec.	_____

5. Do you consider the monthly pattern of production at your mill in 1959 to be a typical pattern? Yes ____ No ____

   If NO, why not? _____

   _____

6. What was the monthly pattern in processed wood inventories on hand at your mill in 1959? (If monthly data are not available, indicate peak-and low-inventory months and amounts.)

Jan.	_____	July	_____
Feb.	_____	Aug.	_____
Mar.	_____	Sept.	_____
April	_____	Oct.	_____
May	_____	Nov.	_____
June	_____	Dec.	_____

7. Do you consider the monthly pattern in processed wood inventories at your mill in 1959 to be a typical pattern?
Yes ____ No ____
If NO, why not? _____

8. Do you prefer seasonal variations in the volume of processed product inventories on hand at your mill? Yes ____ No ____

If YES, what is your preferred pattern of inventories?

_____

If NO, do you have an objective of maintaining a fixed ratio in the volume of processed product inventories to product sales? Yes ____ No ____
If YES, what is this ratio? _____

9. Is there a physical limit to the volume of processed product inventories that can be stored in yard economically?
Yes ____ No ____
If YES, what is the nature of the limitation? _____

If YES, what is the maximum volume? _____

10. Is there a technological limit to the volume of processed product inventories that can be stored in yard because of insects, fungi, etc.? Yes ____ No ____

If YES, what is the nature of the limitation? _____

If YES, what is the maximum volume? _____

11. What percentages of the volume of your principal products in 1959 were produced to fill previously obtained orders?

	Product	%
a.	_____	_____
b.	_____	_____
c.	_____	_____
d.	_____	_____

12. What area did your sales territory cover in 1959? (List by principal products. List counties or cities, or outermost states or cities. State maximum distances.)

_____

13. Have there been any significant changes in the product market areas for your firm over the period 1950-59?

Yes ____ No ____

If YES, what were the changes? _____

_____

_____

14. To which types of buyers did sales of your principal products in 1959 go? (Estimate, by products, the volume or percent of total volume.)

	Volume	%	Volume	%	Volume	%
a. Manufacturer						
b. Wholesaler						
c. Retailer						
d. Industrial user						
e. Other (specify)						

15. Have there been any significant changes in the volumes of products going to different types of buyers of your principal products over the period 1950-59? Yes ____ No ____

If YES, what were the changes? _____

_____

_____

If YES, what explanations can you give for these changes?

_____

_____

16. How many different buyers of your products did you sell to in 1959?

	No.		No.
a. Manufacturer	_____	d. Industrial user	_____
b. Wholesaler	_____	e. Other (specify)	
c. Retailer	_____	_____	_____

17. Have there been any significant changes in the numbers of buyers of your principal products over the period 1950-59?

Yes ____ No ____

If YES, what were the changes? _____

_____

If YES, what explanations can you give for these changes?

_____

_____

_____

18. What is the typical time interval between receipt of an order from a buyer and the filling of that order? (List separately by principal products, if time interval varies.)

a. How much variation from the typical time interval occurs?

b. What are the causes of variations from the typical time interval?

J. Agent sources of raw wood products, 1959:

Name	Address

APPENDIX B. INTERMEDIATE MARKET AGENT INTERVIEW SCHEDULE

CONFIDENTIAL

Date _____
Recorder _____
State _____

Form No. 2

NCM-27 Project

INTERMEDIATE MARKET AGENT

Name of agent or firm _____

Address _____

A. General:

1. Do you buy and sell or receive a commission for handling rough wood products? Yes ____ No ____

2. How many years has your firm been operating at your present location? _____ years.

3. What form of business organization does your firm have?
   a. _____ Single owner
   b. _____ Partnership
   c. _____ Corporation
   d. _____ Cooperative

4. Is your firm engaged full time in the marketing of raw timber products? Yes ____ No ____

   If NO, what other business or occupation is your firm engaged in?
   a. Sawmill operator ___
   b. Operator of other wood-using mill (specify)____ ___
   c. Store operator ___
   d. Farmer ____
   e. Wage earner ____
   f. Other(specify) _____

   If NO, what percentage of your gross revenues in 1959 was realized by sales of raw timber products?
   _____ percent.

5. What were the principal raw timber products handled by your firm in 1959?
   a. _____ d. _____
   b. _____ e. _____
   c. _____ f. _____

6. Is your marketing of raw timber products typically a year-round business? Yes ____ No ____
   If NO, what are the typical months of operation? _____
   _____

7. How many full-time employees in your timber-marketing business did you have in 1959? _____ employees.

8. How many seasonal employees in your timber-marketing business did you have in 1959? _____ employees.

B. Quantities of wood purchases: (volume by _____ log rule)

1. What was the total volume by product and unit of measure, of your raw timber purchases in 1959? (List only timber handled as part of your business as an intermediate market agent.)

	Product	Volume
a.		
b.		
c.		
d.		
e.		
f.		

2. What was the monthly pattern in your raw timber purchases in 1959? (List separately by products)

Jan.					
Feb.					
Mar.					
April					
May					
June					
July					
Aug.					
Sept.					
Oct.					
Nov.					
Dec.					

If monthly data are not available, what were the:
(List separately by products)

a. Peak inventory months and amounts (aver.)					
b. Lowest inventory months and amounts (aver.)					
c. Other months and amounts (aver.)					

3. Do you consider the monthly pattern in volume of your wood purchases in 1959 to be a typical pattern? Yes ____ No ____

   If NO, why not? _____

4. How do you explain the seasonal variations in your typical pattern of wood purchases? _____

5. What changes in the annual volume of your wood purchases took place in the years 1950-59? (List by products.)

Year	All products				
1959					
1958					
1957					
1956					
1955					
1954					
1953					
1952					
1951					
1950					

C. Inventories of raw wood:

1. Did you assemble raw timber products at your own wood yard in 1959? Yes ____ No ____

   IF YES, ANSWER QUESTIONS 2 TO 6.
   IF NO, SKIP TO SECTION D. SOURCES OF WOOD PURCHASES.

2. What raw timber products did you assemble at your own wood yard in 1959?

   a. _____ c. _____ e. _____
   b. _____ d. _____ f. _____

3. Why do you assemble raw timber products? _____

4. What was the seasonal variation in the volume of raw timber inventories on hand at your yard in 1959? (List separately by products.)

a.	Peak inventory months and amounts (aver.)				
b.	Lowest inventory months and amounts (aver.)				
c.	Other months and amounts (aver.)				

5. Do you consider the seasonal pattern in raw timber inventories at your yard in 1959 to be a typical pattern?
   Yes ____ No ____
   If NO, why not? _____

6. Do you have an objective of maintaining a fixed ratio in the volume of raw timber inventories to sales? Yes ____ No ____

   If YES, what is this ratio? _____

D. Sources of wood supply:

1. Where is your 1959 wood supply area located? (List counties or states if only a few are involved. Outline on attached county map, if possible. State radius of operations in miles.)
   a. Counties or states. _____
   _____
   b. Radius of operations. _____

2. Have there been any significant changes in your wood supply area over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____
   _____
   _____

3. What is the ownership of the forest land from which your 1959 wood supply was obtained? (Estimate % of total volume from each source.)

	%		%
a. Own land	_____	d. Nat. forest	_____
b. Farmer	_____	e. State forest	_____
c. Other private	_____	f. Other public	_____
		g. Don't know	_____

4. Have there been any significant changes in your wood supply from different forest landownership sources over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____
   _____
   _____

   If YES, what explanations can you give for these changes?
   _____
   _____

5. From which agent sources was your 1959 wood supply obtained? (Estimate % of total volume obtained from each source.)

	%		%
a. Own employees:		b. Producer	_____
(1) From own lands	_____	c. Other agent (specify)	
(2) From other lands	_____	_____	_____

6. Have there been any significant changes in the agent sources of your wood supply over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____
   _____
   _____

   If YES, what explanations can you give for these changes?
   _____
   _____

E. Wood procurement methods and policies:

1. What percentages of your 1959 cut wood purchases were obtained under the following types of agreements?

	%
a. Written contract	_____
b. Oral contract	_____

QUESTIONS 2 TO 5 APPLY ONLY TO WRITTEN CONTRACTS. IF THERE WERE NO WRITTEN CONTRACTS, SKIP TO QUESTION 6.

2. How far in advance of the beginning of wood deliveries are contracts usually negotiated? _____

_____

3. What are the details of standard written contracts for cut wood purchase? (Obtain printed copies where possible. Check the following items which are included in contract specifications; then describe as much as possible.

a. _____ Kind of wood _____
b. _____ Amount of wood _____
c. _____ Size of wood _____
d. _____ Quality of wood _____
e. _____ Time or period of delivery _____
f. _____ Method of payment _____
g. _____ Time of payment _____

4. How binding are the provisions of standard written contracts for cut wood purchases (i.e., how much leeway is given suppliers in completing terms of contract and how much leeway does your firm allow itself in terminating contracts)? _____

_____

_____

_____

_____

5. Did you buy cut wood in 1959 only when you had a contract for its resale? Yes ____ No ____

If NO, explain your policy of purchases in advance of sales contracts. _____

_____

_____

_____

QUESTIONS 6 TO 9 APPLY ONLY TO ORAL CONTRACTS FOR CUT WOOD PURCHASES. IF THERE WERE NO SUCH CONTRACTS, SKIP TO QUESTION 10.

6. How far in advance of the beginning of wood deliveries are contracts usually negotiated? _____

7. What are the details of oral contracts for cut wood purchases? (Check the following items which are included in agreements; then describe as much as possible.)

   a. _____ Kind of wood _____
   b. _____ Amount of wood _____
   c. _____ Size of wood _____
   d. _____ Quality of wood _____
   e. _____ Time or period of delivery _____
   f. _____ Method of payment _____
   g. _____ Time of payment _____

8. How binding are the provisions of oral contracts for cut wood purchases (i.e., how much leeway is given suppliers in completing terms of contract and how much leeway does your firm allow itself in terminating contracts?)

9. Did you buy cut wood in 1959 only when you had a contract for its resale? Yes ____ No ____

   If NO, explain your policy of purchases in advance of sales contracts. _____

QUESTIONS 10 TO 13 APPLY ONLY TO STUMPAGE PURCHASES BY YOUR FIRM. IF NO STUMPAGE PURCHASES ARE MADE, SKIP TO QUESTION 14.

10. What percentages of your firm's 1959 stumpage purchases (in terms of volume) were obtained under the following types of agreements?

	%
a. Written contract with public landowners	_____
b. Written contract with private landowners	_____
c. Oral contract	_____

11. What are the details of your firm's standard contracts for stumpage purchases from private landowners? (Check the following items which are included in agreements; then describe as much as possible.)

a. _____ Species _____
b. _____ Amount of timber _____
c. _____ Size of timber _____
_____
d. _____ Quality of timber _____
_____
e. _____ Time or period of harvest _____
f. _____ Method of payment _____
_____
g. _____ Time and basis of measurement _____
_____

12. If the standard contract for stumpage purchases from private landowners is a written contract, and if oral contracts are also made, how does the oral contract differ in its provisions from the written contract? _____
_____
_____
_____
_____

13. Does the standard contract for stumpage purchases from private landowners specify any conditions under which timber is to be harvested? Yes ____ No ____

If YES, to what percentage of the 1959 private purchases do these specifications apply? _____ percent.
If YES, what are the specifications? _____
_____
_____

If NO, are there any harvest conditions your firm will accept in contracts for stumpage purchases upon a private landowner's insistence? Yes ____ No ____

If YES, what are the conditions? _____
_____
_____

14. What percentages of your 1959 wood purchases were obtained through negotiations initiated by your own firm or initiated by sellers?

	%
a. Own firm	
b. Sellers	
c. Indefinite	

15. When your firm takes the initiative in negotiating wood purchases, what are the methods you use in contacting potential suppliers? _____

16. From how many different persons or agencies was your 1959 wood supply purchased?

	No.		No.
a. Nonproducer landowner		c. Other agent (specify)	
b. Producer			

Was 1959 a typical year? Yes ____ No ____

If NO, why not? _____

17. What quantities of your 1959 raw wood receipts were purchased on the stump, roadside, and delivered?

	Quantity	%
On the stump		
Roadside		
F.o.b. railroad		
Delivered to mill		

18. Did the points of purchase of 1959 raw wood receipts vary by agent sources of wood? Yes ____ No ____

If YES, how did they differ? _____

19. To what degree does your firm perform the following functions in regard to wood procurement?

a. Logging? _____

b. Hauling? _____

20. Are any wood suppliers offered payments (loans) in advance of time of payment specified in a standard contract?
Yes ____ No ____
If YES, is this the usual procedure adopted by your firm?
Yes ____ No ____
If YES, does the producer pay interest on such prepayments or loans? Yes ____ No ____
If YES, what is the size limitation on the prepayments or loans offered? _____

21. Are any wood suppliers offered other business aids by your firm? Yes ____ No ____

If YES, is this the usual procedure adopted by your firm?
Yes ____ No ____
If YES, what are these business aids? _____

22. Do you assign exclusive procurement territories to your wood suppliers? Yes ____ No ____

If NO, what policy do you follow to minimize the overlapping of procurement territories by your wood suppliers? _____

23. Do you object to having your wood suppliers take contracts to supply wood to other firms using the same kind of timber?
Yes ____ No ____
If YES, what action do you take? _____

24. Do you have any wood procurement policy designed to minimize wide fluctuations in the volume of wood called for in successive contracts made with suppliers? Yes ____ No ____

If YES, explain what this policy is. _____

F. Prices:

1. What standard delivered prices did your firm pay per unit of volume to your wood suppliers at the end of 1959? (Fill in as many items as possible, by products and/or species.)

Products and/ or species	Road-side	Delivered to rr.	F.o.b. rr.	Trucked to mill	Rr. to mill

2. Are there any differences in the prices paid by your firm for delivered wood on the basis of distance of haul?

   Yes ____ No ____

   If YES, what are these differences by mode of transportation (and which distances do the prices quoted in Item 1 above refer to?) _____

3. What changes in prices paid for wood by your firm have occurred over the period 1950-59? _____

4. Do you have any difficulty in obtaining sufficient market price information as a basis for your business decisions?

   a. On products you have to buy? Yes ____ No ____

   b. On products you have to sell? Yes ____ No ____

   If YES to a. or b., explain. _____

G. Costs:

1. What stumpage costs per unit of volume applied to your wood purchases at the end of 1959? (Estimate prevailing contract rates, if stumpage was not paid for directly by your own firm.)

Products and/or species	Average cost	Minimum cost	Maximum cost

2. What logging costs (felling and bucking and skidding) per unit of volume applied to your wood purchases at the end of 1959? (Estimate prevailing contract rates, if logging costs were not paid for directly by your firm.)

Products and/or species	Average cost	Minimum cost	Maximum cost

3. What truck-hauling costs per unit of volume applied to your wood purchases at the end of 1959? (Estimate prevailing contract rates, if hauling costs were not paid for directly by your firm.)

	Product				
Truck to mill:					
(1) Aver. cost					
(2) Min. cost					
(3) Max. cost					
(4) Cost by distance zones					
Truck to rr.:					
(1) Aver. cost					
(2) Min. cost					
(3) Max. cost					
(4) Cost by distance zones					

4. Do truck-hauling costs to mill include the cost of loading? Yes ____ No ____

5. Do truck-hauling costs to mill include the cost of unloading? Yes ____ No ____

6. Do truck-hauling costs to railroad include the cost of unloading and loading onto railroad cars? Yes ____ No ____

7. What railroad-hauling costs per unit of volume applied to wood products delivered to your markets at the end of 1959?

	Product				
Rr. to market:					
(1) Aver. cost					
(2) Min. cost					
(3) Max. cost					
(4) Cost by distance zones					

H. Sales of raw timber products:

1. What was the gross sales value of timber products sold by your firm in 1959? _____

2. What was the total volume, by product and unit of measure, of your timber products sales in 1959? (List only timber handled as part of your business as an intermediate agent.)

Product	Volume
a.	
b.	
c.	
d.	
e.	
f.	

3. What changes in the annual volume of your timber products sales took place in the years 1950-59? (List separately by products.)

Year	All products					
1959						
1958						
1957						
1956						
1955						
1954						
1953						
1952						
1951						
1950						

4. What area did your sales territory cover in 1959? (List by principal products. List counties or cities, or outermost states or cities. State maximum distances.) _____

5. Have there been any significant changes in the product market areas for your firm over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

6. To which types of buyers did sales of your principal products in 1959 go? (Estimate, by products, the volume or percent of total volume.)

	Volume	%	Volume	%	Volume	%	
a. Manufacturer							
b. Wholesaler							
c. Retailer							
d. Industrial user							
e. Other (specify)							

7. Have there been any significant changes in the volumes of products going to different types of buyers of your principal products over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

   If YES, what explanations can you give for these changes?

8. How many different buyers of your timber products did you sell to in 1959?

	No.		No.
a. Manufacturer	_____	d. Industrial user	_____
b. Wholesaler	_____	e. Other (specify)	
c. Retailer	_____	_____	_____

9. Have there been any significant changes in the numbers of buyers of your principal products over the period 1950-59?

   Yes ____ No ____

   If YES, what were the changes? _____

   If YES, what explanations can you give for these changes?

10. What is the typical time interval between date of a purchase contract with a buyer and product delivery? (List separately by principal products, if time interval varies.) _____

a. How much variation from the typical time interval occurs?

b. What are the causes of variations from the typical time interval?

I. Agent sources of raw wood products, 1959:

Name	Address

APPENDIX C. PRODUCER INTERVIEW SCHEDULE

CONFIDENTIAL

Date _____
Recorder _____
State _____

Form No. 3

NCM-27 Project

TIMBER PRODUCER

Name of timber producer _____

Address _____

A. General:

1. How many years have you been operating as a timber producer at your present location? _____ Years.

2. Are you a full-time timber producer? Yes ____ No ____

   If NO, what other business or occupation are you engaged in?

   a. Sawmill operator _____
   b. Operator of other wood-using mill (specify) _____ _____
   c. Store operator _____
   d. Farmer _____
   e. Wage Earner _____
   f. Other (specify) _____ _____

   If NO, what percentage of your gross revenues in 1959 was realized from your business as a timber producer?
   _____ Percent.

3. What were the principal raw timber products you handled in 1959?

   a. _____ d. _____
   b. _____ e. _____
   c. _____ f. _____

4. Is your timber-producing business typically a year-round business? Yes ____ No ____

   If NO, what are the typical months of operation? _____
   _____

5. How many full-time employees in your timber-producing business did you have in 1959? _____ employees.

   How many are members of your family? _____ employees.

6. How many seasonal employees in your timber-producing business did you have in 1959? _____ employees.

   How many are members of your family? _____ employees.

B. Quantities of timber purchases: (volume by _____ log rule)

1. Did you purchase any timber as a basis for your timber-producing business in 1959? Yes ____ No ____

If YES, what volume, by product and unit of measure, was purchased as stumpage in 1959?

	Product	Volume		Product	Volume
a.			d.		
b.			e.		
c.			f.		

Was 1959 a typical year? Yes ____ No ____

If NO, why not? _____

_____

_____

_____

If YES, what volume, by product and unit of measure, was purchased as cut wood in 1959?

	Product	Volume		Product	Volume
a.			d.		
b.			e.		
c.			f.		

Was 1959 a typical year? Yes ____ No ____

If NO, why not? _____

_____

_____

_____

IF NO, SKIP TO C. SOURCES OF WOOD SUPPLY.

2. What changes in the annual volume of your timber purchases took place in the years 1950-59? (List by products)

Year	All products				
1959					
1958					
1957					
1956					
1955					
1954					
1953					
1952					
1951					
1950					

C. Sources of wood supply:

1. Where is your 1959 wood supply area located? (List counties if only a few are involved. State radius of operations in miles.)
   a. Counties _____
   b. Radius of operations _____

2. Have there been any significant changes in your wood supply area over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

3. What is the ownership of the forest land from which your 1959 wood supply was obtained? (Estimate % of total volume from each source.)

	%		%
a. Own land	_____	d. Nat. Forest	_____
b. Farmer	_____	e. State forest	_____
c. Other private	_____	f. Other public	_____

4. Have there been any significant changes in your wood supply from different forest landownership sources over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

   If YES, what explanations can you give for these changes?

5. From what agent sources was your 1959 wood supply obtained? (Estimate % of total volume obtained from each source.)

	%		%
a. Own employees:		b. Other producer	_____
(1) From own lands	_____	c. Other agent (specify)	
(2) From other lands	_____	_____	_____

6. Have there been any significant changes in the agent sources of your wood supply over the period 1950-59? Yes ____ No ____

   If YES, what were the changes? _____

   If YES, what explanations can you give for these changes?

D. Wood procurement methods and policies:

1. What percentages of your 1959 wood supply were obtained by the following stumpage acquisition methods?

	%
a. Stumpage from own lands	_____
b. Stumpage purchased by producer	_____
c. Stumpage purchased in producer's name by product buyer	_____
d. Stumpage provided by product buyer	_____

QUESTIONS 2 TO 15 APPLY ONLY TO STUMPAGE PURCHASES BY PRODUCER. IF NO STUMPAGE PURCHASES WERE MADE, SKIP TO QUESTION 16.

2. What percentages of your 1959 stumpage purchases (in terms of volume) were obtained under the following types of agreements?

	%
a. Written contract with public landowners	_____
b. Written contract with private landowners	_____
c. Oral contract	_____

3. What are the details of your standard contracts for stumpage purchases from private landowners? (Check the following items which are included in agreements; then describe as much as possible.)

a. _____ Species _____
b. _____ Amount of timber _____
c. _____ Size of timber _____
d. _____ Quality of timber _____
_____
e. _____ Time or period of harvest _____
f. _____ Method of payment _____
_____
g. _____ Time and basis of measurement _____
_____

4. If the standard contract for stumpage purchases from private landowners is a written contract, and if oral contracts are also made, how does the oral contract differ in its provisions from the written contract?

_____
_____
_____
_____
_____

5. Does your standard contract for stumpage purchases from private landowners specify any conditions under which timber is to be harvested? Yes ____ No ____

   If YES, to what percentage of your 1959 purchases do these specifications apply _____ Percent.

   If YES, what are the specifications? _____

   If NO, are there any harvest conditions your firm will accept in contracts for stumpage purchase upon a private landowner's insistence? Yes ____ No ____

   If YES, what are the conditions? _____

6. How binding are your contracts for stumpage purchase (i.e., how much leeway do you allow yourself in terminating contracts)?

7. How far in advance of the beginning of harvest operations are stumpage purchase contracts usually negotiated? _____

8. Do you buy stumpage only when you hold a contract for the sale of products? Yes ____ No ____

   If NO, explain your policy of stumpage purchases in advance of contracts for the sale of products. _____

9. What percentages of your 1959 stumpage purchases were obtained through negotiations initiated by you or initiated by landowners?

	%
a. Producer	_____
b. Landowner	_____
c. Indefinite	_____

10. When you take the initiative in negotiating stumpage purchases, what are the methods you use in contacting potential suppliers?

_____
_____
_____
_____

11. How many stumpage purchase contracts did you make in 1959?
_____ contracts.
Was 1959 a typical year? Yes ____ No ____
If NO, why not? _____
_____

12. From how many different persons or agencies did you obtain your stumpage purchases in 1959? _____ persons or agencies.

Was 1959 a typical year? Yes ____ No ____
If NO, why not? _____
_____

13. Is there a minimum volume per acre below which you will not consider stumpage purchase? Yes ____ No ____

If YES, what is this minimum? _____
_____

14. Is there a minimum volume per tract below which you will not consider stumpage purchase? Yes ____ No ____

If YES, what is this minimum? _____
_____

15. Is there a minimum value of timber per tract below which you will not consider stumpage purchase? Yes ____ No ____

If YES, what is this minimum? _____
_____

16. Did you receive funds from any of your product buyers for stumpage purchases in 1959? Yes ____ No ____

If YES, which buyers? _____
_____
If YES, what portion of your total stumpage purchases in 1959 did these funds cover? _____

17. Did you subcontract some or all of the logging operations in your timber-producing business in 1959? Yes ____ No ____

If YES, what percentage of the volume handled was subcontracted? _____ percent.

If YES, did subcontracting apply to

a. Felling and bucking? Yes ____ No ____

b. Skidding? Yes ____ No ____

If YES, why didn't you handle all the logging operations yourself? (Check. If more than 1 reason, number in order of importance.)

(a) _____ Lacked necessary equipment
(b) _____ Lacked logging experience
(c) _____ Inadequate family or hired labor available
(d) _____ Believed subcontracting to be the cheaper method
(e) _____ Producer's time more valuable for other purposes
(f) _____ Other demands on producer's time
(g) _____ Other (specify) _____

18. Did you subcontract some or all of the hauling operations in your timber-producing business in 1959? Yes ____ No ____

If YES, what percentage of the volume handled was subcontracted? _____ percent.

If YES, why didn't you handle all of the hauling operations yourself? (Check. If more than 1 reason, number in order of importance.)

(a) _____ Lacked necessary equipment
(b) _____ Lacked hauling experience
(c) _____ Inadequate family or hired labor available
(d) _____ Believed subcontracting to be the cheaper method
(e) _____ Producer's time more valuable for other purposes
(f) _____ Other (specify) _____

19. Did you receive in 1959 funds from any product buyers in advance of time of payment specified in a standard contract to facilitate your logging or hauling responsibilities? Yes ____ No ____

If YES, which buyers? _____

_____

If YES, for what purposes? _____

_____

20. Did you receive in 1959 any other business aids from any product buyers to facilitate your logging or hauling responsibilities? Yes ____ No ____

If YES, which buyers? _____

_____

If YES, what aids? _____

_____

E. Prices Received:

1. What prices did you receive per unit of volume for wood products you sold in 1959? (Fill in as many items as possible, by products and/or species.)

		Products and/or species				
a.	Roadside					
b.	Delivered to rr.					
c.	F.o.b. rr.					
d.	Trucked to mill					
e.	Rr. to mill					

2. To which agents did you sell the products and/or species listed above? (Check appropriate cells.)

		Products and/or species				
a.	Dealer					
b.	Concentration yard					
c.	Other intermediate agent					
d.	Wood-using mill					
e.	Other producer					
f.	Other (specify)					

3. Did you have any difficulty in obtaining sufficient market price information as a basis for your business decisions?

a. On the products you have to buy? Yes ____ No ____
b. On the products you have to sell? Yes ____ No ____

If YES, to a. or b., explain. _____

_____

_____

_____

_____

F. Costs:

1. What stumpage costs per unit of volume applied to the wood products you handled in 1959? (Estimate cost imputed by you if you used your own stumpage.)

Products and/or species	Purchased stumpage	Own stumpage

2. What logging costs (felling and bucking and skidding) per unit of volume applied to the wood products you handled in 1959? (Estimate cost imputed by you if you performed your own logging.)

Products and/or species	Subcontracted logging	Own logging

3. What truck-hauling costs per unit of volume applied to the wood products you handled in 1959? (Estimate cost imputed by you if you performed your own hauling.)

Products and/or species	Subcontracted hauling		Own logging	
	Cost	Distance	Cost	Distance

G. Sales of timber products:

1. What was the gross sales value of timber products sold by you in 1959? _____

2. What was the total volume, by product and unit of measure, of your timber products sales in 1959? (List only timber handled as part of your business as a timber producer.)

Product	Volume
a.	
b.	
c.	
d.	
e.	
f.	

3. What were the seasonal variations by product, in your timber products deliveries in 1959?

	Product				
a. Peak months and amounts (aver.)					
b. Lowest months and amounts (aver.)					
c. Other months and amounts (aver.)					

4. Do you consider the timing in your timber products deliveries in 1959 to be a typical pattern? Yes ____ No ____

If NO, why not? _____

_____

_____

5. Was the timing in your timber products deliveries in 1959 required by your product buyers? Yes ____ No ____

If YES, would you have preferred a different timing of deliveries? Yes ____ No ____

If YES, what is your preferred timing of deliveries?

_____

_____

_____

If NO, how do you explain the timing of your deliveries?

_____

_____

_____

6. What changes in the annual volume of your timber products sales took place in the years 1950-59? (List separately by products.)

Year	All products					
1959						
1958						
1957						
1956						
1955						
1954						
1953						
1952						
1951						
1950						

7. What explanations can you give for annual fluctuations in your timber product sales? _____

_____

_____

_____

_____

_____

_____

8. To which types of buyers did sales of your principal products in 1959 go? (Estimate by % of total volume.)

	%		%
a. Manufacturer	_____	d. Other intermediate agent (specify)	
b. Concentration yard	_____	_____	_____
c. Dealer	_____	e. Other (specify)	
		_____	_____

9. Have there been any significant changes in the volumes of your products going to different types of buyers over the period 1950-59? Yes ____ No ____

If YES, what were the changes? _____

_____

_____

_____

If YES, what explanations can you give for these changes?

_____

_____

_____

10. How many different buyers of your timber products did you sell to in 1959?

	No.		No.
a. Manufacturer	_____	d. Other intermediate agent (specify)	
b. Concentration yard	_____	_____	_____
c. Dealer	_____	e. Other (specify)	
		_____	_____

11. Have there been any significant changes in the numbers of buyers of your principal products over the period 1950-59?

Yes ____ No ____

If YES, what were the changes? _____

_____

_____

If YES, what explanations can you give for these changes?

_____

_____

12. Did you have a contract(s) to sell prior to your harvesting of wood in 1959? Yes ____ No ____

13. What is the typical time interval between date of a purchase contract with a buyer and product delivery? _____

_____

_____

_____

a. How much variation from the typical time interval occurs? _____

_____

b. What are the causes of variations from the typical time intervals? _____

_____

H. Other producers of raw wood products, 1959:

Name	Address