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LUMBER USAGE
BY GREATER LANSING MANUFACTURING FIRMS
FOR THE YEAR 1959

Thesis for the Degree of M. S.
MICHIGAN STATE UNIVERSITY
Mitchell B. Foster
1961



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AN ABSTRACT

Submitted to the College of Agriculture of Michigan
State University of Agriculture and Applied
Science in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE

Department of Forest Products

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Approved _____

ABSTRACT

In Michigan today the allowable hardwood cut is about 64% more than the actual cut. This study is an attempt to explain why our hardwood utilization is less than it could be and also what can be done to remedy this situation.

Manufacturing firms in the Lansing area were first contacted by phone and then personally interviewed. It was found that Michigan hardwoods could be used for shipping containers and other purposes currently being filled by western and southern softwoods. Less valuable species such as beech, elm, and aspen were found potentially suitable for shipping containers and pallets; in addition the actual cut was far under that allowed.

In talking to the lumber buyers some of the dissatisfactions and complaints concerning Michigan hardwoods were brought to light. It seems that better promotional efforts as well as more uniform grading between mills is needed before hardwood lumber markets can be fully utilized. Poor service, poor sawing, wet lumber, and other similar complaints point to the inefficiency of the Michigan sawmill. The writer feels that the only way to make the necessary improvements such as more promotional effort, is for Michigan sawmills to form some sort of organization where they can mutually discuss their problems and then take steps to correct them.

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ACKNOWLEDGMENTS

The author wishes to express his sincere thanks to Dr. Eldon A. Behr, whose guidance and supervision played an important part in the completion of this thesis.

He is also indebted to Drs. Donald A. Taylor and Harold J. Raphael who, along with Dr. Behr, offered helpful suggestions and improvements.

Lastly, the author wishes to thank Dr. Aubrey E. Wylie and Mr. Raymond E. Pfeifer for their continuous interest and assistance.

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PART I -- INTRODUCTION

HISTORICAL BACKGROUND

For thirty golden years Michigan led the nation in lumber production. During this period from 1869 to 1899 over 160 billion board feet of white pine lumber was produced. In the peak year of 1889 nearly 5 1/2 billion feet of lumber was cut, 65% being white pine. No single factor has been more significant in Michigan's industrial development than her virgin stands of pine. It has often been said that Michigan white pine "built" the great city of Chicago.

As early as 1839 cork pine¹ was being floated down the Muskegon River. Soon other rivers like the Tittabawassee, Au Sable, Grand, Pere Marquette, and Manistee came into prominence. The 1882 output for the Tittabawassee alone exceeded 611 million board feet (1). This fantastic figure can be appreciated by comparing it to the 1953 production of 293 million feet for the entire state.

By 1900 the seemingly endless white pine forest of lower Michigan had virtually disappeared. Instead could be seen a barren sweep of stumpland -- the great pine plains of Michigan. The era of boisterous shanty boys and reckless river hogs had passed. The peavey² and supply wannigan were left

¹A term often applied to large white pine logs because they floated high on the water.

²A long tapered piece of wood used as a lever for prying logs and having a hinged metal hook on the larger end.

behind as a memento of past days when white pine lumber sold for \$13 a thousand and "jacks" were paid a dollar a day. The huge pine cuttings and daring river drives are gone forever but the spirit of Michigan's logging era remains with us today in the form of legend and folklore.³

The limbs and tree tops carelessly left by the loggers furnished the tinder for a rash of fires around the turn of the century. In the wake of the fires grew the scrubby second growth underbrush which served a useful purpose by affording cover and a food supply to increasing numbers of rabbits, ruffed grouse, and other small game. Aspen, heretofore labeled a weed, thrived as second growth material. The deer herd grew proportionally to this new food supply which also doubled as a pulpwood source.

Other more valuable hardwoods such as hard and soft maple, red and white oak, elm, ash, beech, and basswood began to take over the pine lands of yesteryear. Today, our white pine forest has dwindled to a bit over a billion board feet of sawtimber.⁴ White pine and other softwoods (primarily red pine) are now being planted in a vast reforestation project

³ See Appendix.

⁴ Softwood having a breast high diameter (D.B.H.) of 9 inches or more and at least one merchantable log. Hardwoods must have an 11 inch d.b.h. and one merchantable log.

which our children and grandchildren will thank us for. However, for the present our eyes must be focused on our increasing volume of mature hardwood and the utilization problems and possibilities it presents.

SCOPE OF THE STUDY

The greater Lansing, Michigan area, including East Lansing and Okemos, was chosen for this study. No similar study has ever been made for this area, although a brief survey of lumber production and markets for low grade hardwoods was made by the Conservation Department in 1954. Certain portions of this survey have been helpful. The idea for this study came from a similar but less detailed analysis made by the Lake States Forest Experiment Station in 1959 for the Minneapolis--St. Paul area.

Since Lansing's economic base is in large part tied to the automobile industry, the observations and conclusions concerning lumber usage derived from this study would seem representative for the automotive industry in the state generally. This study covers only those firms that manufactured a product and that used at least 1000 board feet of lumber in 1959. Distribution, processing, fabrication, and service firms were not contacted as their lumber needs are negligible. No attempt was made to include lumber used for construction

purposes because this would entail a separate study in itself, dealing primarily with softwoods.

Pallets and boxes although made of lumber are finished products in themselves. A problem arose of whether to count these pallets as lumber purchased by the firm using them. Since a portion of these pallets would be included in the footage figures of local pallet producers, the possibility of double counting the lumber became evident. To remedy the situation, only that lumber which was fabricated for shipping purposes by the manufacturing firms was included. Thus, all the pallets, boxes, and crates made in the Lansing area, whether by pallet producers or by individual manufacturing concerns, have been included in the study. However, pallets and shipping containers used by Lansing manufacturers but produced outside the area have not been included.

LIMITATIONS OF THE STUDY

We cannot of course expect the observations and conclusions drawn from a study in one particular location such as Grand Rapids or Lansing to hold true for the state generally. However, in cities such as Flint, Pontiac, and Detroit which rely heavily on the automobile industry I would expect a good portion of the findings in this study to repeat themselves.

We must also consider the human element. In each instance

the information was gained through personal interviews, usually with the person responsible for buying the lumber. Many times financial records were made available; however, in other instances the species used, footage figures, and other important factors were recalled from memory. No man's memory is perfect nor need it be. In some cases estimates were arrived at only after long thought and in several instances disagreement between individuals. I also cannot guarantee that personal bias on the part of the interviewee is not present in the findings. I can only hope that some unknown bias on my own part has not crept into this work.

OBJECTIVES OF THE STUDY

In a study of this nature there can be no single objective, nor can there be a set number of objectives. An effort will first of all be made to show how the lumber is being used. The usages will then be inspected by species to see if Michigan hardwoods are being fully utilized. It is hoped that the information presented herein will broaden existing and perhaps open new markets for Michigan hardwood lumber.

It is also hoped that by pointing out the current problems and disadvantages arising out of the use of Michigan hardwoods, Michigan lumber producers will take steps to correct

these problems and in this way expand their markets.

A further objective lies in comparing lumber usage trends with those of substitute materials such as corrugated paper, plastic, steel, and plywood, which is a manufactured product.

METHODS OF PROCEDURE

Phone calls were initially made to determine which firms to include in the study. Records from the Department of Economic Development, the Industrial Directory of Lansing, as well as the yellow pages of the phone book were all thoroughly checked to be sure that no lumber using manufacturing firms were omitted. Retail and wholesale lumber dealers were also questioned concerning their customers. Consequently, it is felt the sample approaches 100%.

A four page questionnaire⁵ was utilized to gain most of the information. Personal interviews were used in favor of mailed returns because it was felt that the information received would be more accurate and complete. Another major advantage of interviewing was found to be the use of open end questioning and discussion which proved extremely beneficial to these findings.

⁵See Appendix.

PART II -- ANALYSIS OF DATA

HOW LUMBER IS USED

Now we will turn our attention to an analysis of the lumber usage in the Lansing area. 5,483,668 board feet were used by manufacturing firms in 1959. It is important that we determine the purposes for which this lumber was used as such information will enable Michigan lumber producers to utilize their raw materials more fully. In many cases small lumber producers know very little about the uses of the lumber they sell. Lumber usage is grouped into three distinct categories. (See Figure 1).

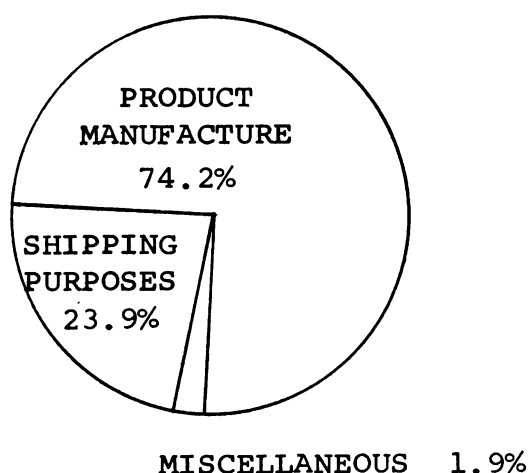


Figure 1.--Percent of lumber purchased by use category.

Product manufacture	4,069,595	board feet
Shipping purposes	1,308,471	
Miscellaneous	<u>105,602</u>	
TOTAL	5,483,668	board feet

Twenty-four firms or 49% listed product manufacture as their main lumber usage. Nineteen, or 38% named their primary use as shipping purposes. Six firms (12.2%) listed miscellaneous uses as foremost.

Pallets, boxes, and crates play a more significant role than these figures indicate however. Nearly half of the lumber used in product manufacture is used to manufacture pallets and boxes for shipping purposes. (See tables 1 and 2). When this figure is added to the amount already listed for shipping purposes we have over 3.1 million board feet or 57.7% of the total. (See table 3).

The significance of this figure can be appreciated when we notice that in the Minneapolis -- St. Paul area only 32.8% of the lumber usage was for shipping purposes. The substantially higher percentage for the Lansing area is undoubtedly due to the influence of the automobile industry, a large user of shipping containers. Of the 49 firms interviewed, 36 were directly or indirectly dependent on the automobile industry. Thus, we would seem to have a natural market for Michigan's overabundance of low grade hardwoods in Lansing, Flint, Pontiac, Detroit and other automotive centers.

HOW SPECIES ARE USED

Softwoods comprise over 56% of the total lumber usage.

TABLE 1.--Species breakdown for softwoods by use category¹

I. Wood Product Manufacture	White Fir	Western Hemlock	Southern Yellow Pine	Ponderosa Pine	Douglas Fir
<u>Type of Wood Product</u>					
Pallets and Boxes			50,000		
Patterns and Dies					
Signs and Displays	3,478		504		10,480
Furniture	250			1,200	
Specialty	990,000	540,000	36,375		40,525
Total Wood Product Manf.	993,728	540,000	86,879	1,200	51,005
II. Shipping Purposes	584,125		287,709	213,750	33,112
III. Miscel- laneous			13,700		52,116
TOTAL	1,577,853	540,000	388,288	214,950	136,233

¹Units of Measure in Board Feet

TABLE 1.--Continued

Redwood	White Pine	Spruce	Sugar Pine	Mixed Softwoods	Total	Percent of Total
					50,000	1.6
	26,380		23,500		49,880	1.6
	4,879	160			19,501	.6
	9,620				11,070	.4
90,000	1,800		5,000		1,703,700	55.0
90,000	42,679	160	28,500		1,850,351	59.3
30	21,071	45,270	4,950		1,190,017	38.4
	4,136			1,250	71,202	2.3
90,030	67,886	45,430	33,450	1,250	3,095,370	100.0

TABLE 2. --Species breakdown for hardwoods by use category¹

I. Wood Product Manufacture	Oak ²	Mixed hardwoods ³	Aspen	Elm	Mahogany	Ash
<u>Type of Wood Product</u>						
Pallets & boxes	730,000	805,580	70,000	150,000		
Patterns & dies	30,000	30			26,500	
Signs & displays						
Furniture	2,040					6,000
Specialty	340,700	26,250		8,275	6,200	16,975
<u>Total Wood Product Manufacture</u>	1,102,740	832,130	70,000	158,275	32,700	22,975
II. Shipping Purposes	1,797	2,300	112,500			
III. Miscel- laneous	24,400	5,000				
TOTAL	1,128,937	839,430	182,500	158,275	32,700	22,975

¹Units of measure in board feet.

²Includes white and red oak.

³Includes oak, elm, beech, and maple primarily.

TABLE 2. --Continued

Hard maple	Cativo	Walnut	Cherry	Birch	Bass- wood	Soft maple	Chest- nut	Total	% of total
								1, 755, 580	73. 6
2, 700	2, 800	150		600				63, 050	2. 7
2, 650		984	1, 800	100		840	600	15, 014	. 6
1, 000		1, 050	50	300	1, 000			401, 800	16. 8
6, 350	2, 800	2, 184	1, 850	1, 000	1, 000	840	600	2, 235, 444	93. 6
1, 857								118, 454	5. 0
5, 000								34, 400	1. 4
13, 207	2, 800	2, 184	1, 850	1, 000	1, 000	840	600	2, 388, 298	100. 0

TABLE 3.--Total softwood and hardwood volume by use category
(in board feet)

Use category:	Softwoods	Hardwoods	Total	Per Cent of Total
Wood product manufacture				
Pallets and boxes	50,000	1,755,580	1,805,580	32.8
Pattern and dies	49,880	63,050	112,930	2.1
Signs and displays	19,501	---	19,501	.4
Furniture	11,070	15,014	26,084	.5
Specialty items	1,703,700	401,800	2,105,500	38.4
Total product mfg.	1,834,151	2,235,444	4,069,595	74.2
Shipping purposes	1,190,017	118,454	1,308,471	23.9
Miscellaneous	71,202	34,400	105,602	1.9
TOTAL	3,095,370	2,388,298	5,483,668	100.0

Source: Tables 1 and 2.

White fir and western hemlock are used predominately in the manufacture of specialty wood products while nearly 75% of the southern yellow pine goes for shipping purposes. On the other hand, pallet and box manufacturers, who specialize in producing shipping containers used only a small percentage of southern yellow pine. Likewise, over one third of the white fir was used for shipping purposes while the pallet and box producers used none at all!

White pine, while used more often than any other species,

represented only about 2% of the softwood total. Sugar pine was used almost entirely for pattern work while specialty items accounted for the redwood usage. The two largest specialty uses are in material handling equipment such as hand trucks, platform trucks, wheelbarrows, etc., and in pre-built homes which are manufactured at the lumber yard and merely assembled at the building site. Michigan produced no more than 2% of the softwood lumber used. Although a portion of the white pine comes from instate, Idaho was mentioned most often as a white pine source.

Oak and "mixed hardwoods" comprise over 82% of the hardwood usage. They are both used primarily in pallet and box manufacture although a sizeable portion of the oak is used in specialty wood products. Aspen and elm usages are restricted almost entirely to pallets and boxes. Mahogany is used as pattern lumber because of its dimensional stability and ease of working. Approximately 70% of the hardwood lumber comes from within Michigan. A sizeable portion of the oak, most of the walnut, and all of the mahogany comes from outstate.

As of 1955, hardwoods comprised over 73% of Michigan's sawtimber. (See Table 4). In the lower peninsula this percentage increased to 88.5%, while in southern lower Michigan¹ hardwoods totaled over 98% of the sawtimber. In view of these

¹A line roughly from Muskegon to Saginaw.

TABLE 4.--Net volume of live sawtimber on commercial forest land by species and forest survey district, Michigan, 1955 (million board feet).

Species	Total	Eastern Upper Michigan	Western Upper Michigan	Northern Lower Michigan	Southern Lower Michigan
Softwoods:					
White pine	1,199	374	427	310	88
Red pine	571	229	74	268	*
Jack pine	384	107	56	221	*
Spruce	702	275	390	37	*
Balsam fir	577	192	322	61	2
Tamarack	65	35	18	6	6
Cedar	1,010	445	455	97	13
Hemlock	1,891	724	1,011	141	15
Total	6,399	2,381	2,753	1,141	124
Hardwoods:					
Sugar maple	4,182	995	2,283	320	584
Yellow birch	1,194	405	752	30	7
Basswood	788	60	192	228	308
Beech	996	457	16	251	272
Elm	2,598	159	155	733	1,551
Red oak	2,012	17	122	676	1,197
White oak	972	*	*	192	780
Aspen	1,174	241	440	447	46
Cottonwood	135	0	0	30	105
Paper birch	460	267	148	42	3
Soft maple	1,474	337	267	192	678
Ash	503	31	76	109	287
Other hardwoods	870	208	43	178	441
Total	17,358	3,177	4,494	3,428	6,259
All species	23,757	5,558	7,247	4,569	6,383

*Less than 1/2 of 1 recognizable unit.

Source: Virgil E. Findell and others, Michigan's Forest Resources, Lake States Forest Experiment Station, St. Paul, Minnesota, September, 1960.

figures, Michigan's lumber production will be predominately hardwood for some time to come. This analysis therefore will take a closer look at actual as well as potential hardwood availability and usage by manufacturing firms.

AVAILABILITY OF MICHIGAN HARDWOODS²

The four pallet and box manufacturers used over 97% hardwood lumber, most of which came from Michigan. On the other hand, firms making pallets and shipping containers on their own used only 9.5% hardwoods. It seems logical to assume that local hardwoods could be utilized for the majority of these shipping needs instead of imported softwoods.

Before discussing potential markets for Michigan hardwoods we would do well to first consider whether the annual hardwood cut could be increased, if so by how much, and for what species in particular. (See Tables 5 and 6).

Allowable cut is defined as the volume of live saw-timber and poletimber that can be cut during a given period while building up or maintaining sufficient growing stock to meet specified growth goals. The term "allowable cut" is often misleading because it includes all trees that should be cut in a given area, and not all the trees that are actually

²Much of the material in this section is from Michigan's Forest Resources, published by the Lake States Forest Experiment Station.

TABLE 5.--Allowable cut, actual cut, and excess of allowable
over actual cut by species, 1954, Michigan
(million cubic feet)

Species	Allowable cut	Actual cut	Excess of All. over actual
Hard maple	24.5	30.2	-5.7
Yellow birch	8.7	9.7	-1.0
Basswood	5.1	2.4	2.7
Beech	9.3	4.8	4.5
Elm	14.6	9.8	4.8
Red Oak	12.4	8.3	4.1
White Oak	5.7	1.8	4.9
Aspen	72.7	43.6	29.1
Cottonwood	1.1	.5	.6
Birch	14.9	2.4	12.5
Soft Maple	13.9	6.7	7.2
Ash	4.0	1.9	2.1
Other hardwoods	11.4	2.7	8.7
TOTAL	198.3	124.8	73.5

Source: Michigan's Forest Resources.

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TABLE 6. --Allowable cut, actual cut, and excess of allowable over actual cut of hardwood sawtimber by district and species group, 1954, Michigan (million board feet)

Species Group	Total			Eastern Upper Michigan		
	Allow- able	Actual cut	Excess of allowable over actual	Allow- able	Actual cut	Excess of allowable over actual
Northern hardwoods ¹	212	219	-7	76	54	22
Oak	68	40	28	1	0	1
Ash, elm, cottonwood	78	47	31	7	3	4
Soft maple ²	40	27	13	10	6	4
Aspen, birch	94	50	44	33	13	20
Other hardwoods	32	7	25	15	0	15
Total	524	390	134	142	76	66

¹Hard maple, yellow birch, beech, basswood

²Red and silver maple

Source: Michigan's Forest Resources

TABLE 6. --Continued

Western Upper Michigan			Northern Lower Michigan			Southern Lower Michigan		
Allow- able	Actual cut	Excess of allowable over actual	Allow- able	Actual cut	Excess of allowable over actual	Allow- able	Actual cut	Excess of allowable over actual
82	121	-39	25	26	-1	29	18	11
2	2	0	24	7	17	41	31	10
2	8	-6	26	12	14	43	24	19
5	8	-3	6	4	2	19	9	10
25	14	11	31	21	10	5	2	3
1	0	1	8	0	8	8	7	1
117	153	-36	120	70	50	145	91	54

cut.³ For example, assume a 4 acre farm woodlot having 10,000 board feet of hardwood timber as the allowable cut. If 3,000 feet from undersized trees are cut in a total cut of 10,000 feet the allowable cut has not been exceeded. However, the growing stock has been severely diminished and many of the less desirable but still merchantable trees of sawtimber size have been left to rot where they stand. This incomplete utilization of the allowable cut has long been a problem to Michigan foresters.

Michigan hardwoods cut in 1954 totaled only 64% of the volume recommended as the allowable cut. Little imagination is needed to see that the hardwood timber cut could be increased significantly. The species where greatest increases could be afforded are for the most part those less valuable hardwoods such as aspen, beech, oak, elm, and soft maple which are well suited for shipping containers and pallets. Substantial overcutting of yellow birch and hard maple has led to the species group "northern hardwoods" being overcut for the state generally. However, in southern lower Michigan the allowable cut is eleven billion board feet over the actual cut. A significant portion of this figure would be composed of the two less valuable species in the group, beech and basswood which both show as

³Personal conversation with Mr. Raymond E. Pfeifer, a member of the Forestry Division of the Michigan Conservation Department.

being undercut in table 5. The variation between allowable and actual cut is greatest for aspen. However, at present only about 6% of the total lumber used for pallets and shipping containers in the Lansing area is aspen.

Thus, new and broader markets for most species of Michigan hardwoods could easily be filled without impairment to the growing stock.

ACTUAL AND POTENTIAL HARDWOOD MARKETS

The quality of merchantable sawtimber in Michigan is poor. Sixty-nine percent of our sawtimber is classified as "No. 3," or the poorest grade. True, a portion of this figure is small, good quality sawtimber which will eventually grow into higher grades, but the percentage of low quality timber is rising. This is because economic conditions and selfish motives have resulted in cutting the best and leaving the worst trees in a stand (7). Unless we cut more lumber from poorer quality trees and in particular the less valuable species such as aspen, beech, elm, and soft maple the percentage of low quality material will continue to increase. The bottleneck seems to be in the utilization of the poorer timber that must be cut to make room for the good timber.

Michigan is indeed fortunate in that the container and pallet industry presents a perfect market for her surplus of

low quality hardwood timber. Why then are western and southern softwoods being used for shipping purposes? Imported softwoods totaled 91% of the crating and pallet lumber purchases by Lansing manufacturing firms'. The prices paid for this lumber appear in table 7.

TABLE 7.--Prices paid for softwood crating lumber in Lansing, Michigan, 1959

(prices per thousand board feet)

Species	Number of users	Highest price paid	Lowest price paid	Average price paid
Ponderosa pine	1	\$ 85	\$ 85	\$ 85
So. yellow pine	7	130	74	97
White fir	4	142	76	103
Douglas fir	7	135	75	110
Spruce	3	165	90	132
White pine	3	180	105	135
Sugar pine	1	140	140	140

The four pallet and box manufacturers utilized Michigan hardwoods and paid an average price of \$61 a thousand board feet. Average prices for southern yellow pine and Douglas Fir, the most frequently used softwoods, were \$97 and \$110 respectively. In view of these figures it seems reasonable to assume that factors other than cost are responsible for this softwood usage.

Perhaps hardwoods aren't as well suited for shipping needs. If this were true, however, why then did aspen account for 62% of the wood boxes made in Minnesota in 1955 (14)? Pallet producers in the Minneapolis--St. Paul area are also finding aspen useful for lightweight expendable pallets. Aspen, being less dense and more resilient than most hardwoods seems to be lasting longer when handling frequency is high because of the reduction in splitting and relative ease of repairing (16).

Being light in weight, use of aspen is advantageous where long shipments are concerned. It also takes paint, ink, or glue readily and is low in price. Aspen's low tendency to split at the nails compensates for its low nail holding ability (See Table 8). Incidentally, the nail holding power of any species can be increased significantly by using drive screw nails. Surprisingly, aspen has a lower shrinkage value than southern yellow pine, western hemlock and the spruces. (See Table 9).

The acceptance of aspen as a usable species has been slow. For many years after the great pine cuttings people considered it merely an overgrown weed. This situation has resulted in aspen lumber being underrated in most corners yet today. It is hoped that the previously mentioned advantages of popple, as it is sometimes called, will become apparent to

TABLE 8.--Nail holding power of selected species of wood.
 (7d cement-coated nails driven to a depth of 1 1/4
 inches and pulled at once)

Species	Specific Gravity*	End surface (pounds)	Radial surface (pounds)	Tang. surface (pounds)
Aspen	.41	157	202	207
Basswood	.41	138	199	194
Beech	.67	358	495	460
Elm	.54	236	344	339
Red Oak	.66	312	466	422
Soft Maple	.51	280	333	338
Douglas Fir	.51	183	273	296
So. Yellow Pine (longleaf)	.64	244	362	376
Spruce	.36	136	177	184
Western Hemlock	.46	149	266	277
White Fir	.41	104	176	203

*Based on volume and weight of oven-dry wood.

Source: Forest Products Laboratory, Technical Note
 236, U. S. Forest Service, Madison, Wisconsin, July, 1931.

TABLE 9.--Shrinkage and strength values for selected species

Species	Specific gravity*	Shrinkage from green to oven dry		
		Radial per cent	Tang. per cent	Volu-metric
Douglas fir	.40	3.6	6.2	103
So. yellow pine	.55	5.3	7.5	124
Spruces, Ave. of Red, White, Sitka.	.37	4.3	7.7	121
Sugar pine	.35	2.9	5.6	79
Western hemlock	.38	4.3	7.9	120
White fir	.35	3.2	7.0	95
White pine	.34	2.3	6.0	83
Aspen	.35	3.5	6.7	111
Basswood	.32	6.6	9.3	158
Beech	.56	5.1	11.0	162
Elm, American	.46	4.2	9.5	145
Elm, Rock	.57	4.8	8.1	137
Red oak	.56	4.2	9.0	143
Soft maple	.49	4.0	8.2	128
White ash	.54	4.6	7.5	126

*Specific gravity oven dry, based on green volume.

Source: U. S. Department of Agriculture, Technical Bulletin 158.

TABLE 9.--Continued

-- Composite strength values --				
Bending strenght	Compressive strength	Stiffness	Hardness	Shock resistance
75	83	142	52	67
106	123	189	76	103
71	74	136	42	71
64	68	112	38	55
74	84	144	50	73
72	73	127	42	60
63	67	119	35	55
63	58	107	31	67
61	62	126	31	54
102	94	169	96	135
85	74	130	66	123
106	97	148	104	189
101	92	168	103	139
93	87	158	79	110
110	106	161	108	139

Michigan lumber users. Aspen, granted, does not have the high strength properties of the softwoods, but it is adequate for all but the most severe loads or stresses. For these situations, other hardwoods such as beech and elm compare very favorably. (Table 9).

At present, Michigan hardwoods total 1,668,808 board feet or only about 30% of the lumber used by Lansing manufacturing firms. It is true that for pattern work, cabinet making, and certain specialty uses imported softwoods are more desirable. However, it was found that if Michigan hardwoods were fully utilized for shipping, maintenance, repairs, and other purposes their total usage would increase to 3,795,517 feet or 68% of the total volume.

At this point several observations seem in order:

1. Michigan has the necessary timber resources to fill a considerable expansion of her hardwood lumber markets.
2. An increasing percentage of Michigan's hardwood sawtimber is in the less valuable species which must be utilized to make growing room for the more valuable species.
3. There are certain advantages in using these less valuable species, which have already been mentioned.
4. Although Michigan hardwoods seem well fitted for more extensive usages, such as for shipping containers, imported softwoods remain the dominant factor. Why?

PROBLEMS AND COMPLAINTS ARISING FROM THE USE
OF MICHIGAN HARDWOODS

Before attacking any problem one should first become thoroughly acquainted with the problem. Similarly, before attempting to increase the utilization of Michigan hardwoods, let us first consider the problems and complaints being currently encountered. These complaints or dissatisfactions can be grouped into three categories: (See Table 10).

1. Those due to the inherent qualities of the wood.
2. Those having to do with economic factors or outside influences which are difficult to control.
3. Those which are the fault of Michigan lumber producers and could be corrected.

For the most part the complaints were directed against hardwoods generally rather than a particular species. This, no doubt, is partially due to a limited knowledge of the individual species. The hardness of the lumber itself accounts for most of the complaints given under the inherent characteristics category. The hardness of course cannot be altered. However, feelings about it could be improved by sound promotional efforts.

I might add that hard maple was extolled more often than any other native hardwood. It is used successfully for a share of the pattern work and one individual stated that, "Michigan hard maple is the finest available." Another firm

TABLE 10.--Reasons for not utilizing Michigan hardwoods
as given by Lansing manufacturing firms.

Species	Due to inherent qualities of the wood						Due to or other			
	Poor Workability	Too Hard -- Splits Easily	Warpage A Problem	Nailing Costs Higher	Too Heavy	Contains Mineral Streaks	Labor Costs High So Wants Woods Easy to Work	Workers Stay Happier With Softwoods	Wood Expense A Small Item, Too Much Trouble to Change	Traditional Use of Softwoods
Ash		1								
Birch										
Cherry										
Elm	1		1							
Oak	2					1				
Walnut										
Mixed hardwoods	5	2	4	2	4		2	1	4	1
TOTAL	8	3	5	2	4	1	2	1	4	1

TABLE 10.--Continued

economic factors outside influences		Fault of lumber producers										
Plastic Usage Reduces Lumber Needs	Plywood Usage Reduces Lumber Needs	Easier To Use Steel	Corrugated Paper Taking Over Lumber Market	Price Too High	Poor Promotion - Complacent Attitude - Never Been Contacted	Price Too High For Native Kiln-Dry Lumber	Quality of Crating Lumber Varies From Mill to Mill	Lumber Too Wet	Poor Service	Poor Sawing at the Mill	Shortages of Particular Species or Size	Waste Too High
2	1	3	3	6	6	1	1	2	2	1	3	1
2	1	3	3	6	7	1	1	2	3	1	8	1

mentioned elm as being suitable for crating lumber especially if green narrow boards were used, so that nailing would be easier and warpage reduced.

An inspection of the second category, outside influences, reveals some of the economic reasons why softwoods are preferred. Due to an ever-increasing wage level nearly everyone today is vitally interested in saving labor costs. Two firms mentioned that since softwoods are easier to work, the consequent saving in labor costs more than offsets the increased material costs of using them. It is hard to combat such preferences, but Michigan lumber producers should at least be aware of them. In another instance, union pressure has kept a firm using softwoods because the workers complained when heavier and rougher hardwoods were used.

The threat that substitute materials pose to lumber markets is a national as well as a local problem for lumber producers. In this study, nine different firms listed either corrugated paper, steel, plastics, or plywood as successful substitutes for their lumber needs. In 1959, Lansing manufacturers used 542,792 square feet of plywood. Table 11 shows the trend to be decidedly upward.

True, anticipated plywood increases total 22 while only 17 firms expect their lumber volume to increase, but the alarming factor is that 12 concerns expect their lumber volume to

TABLE 11.--Expected plywood and lumber usage of Lansing manufacturing firms by the year, 1970

Product	Number of Firms Expecting Increases				Number of Firms Expecting Decreases				Expect No Change
	0- 20%	20- 100%	101- 500%	Tot- al	0- 20%	21- 100%	101- 500%	Tot- al	
Lumber	5	8	4	17	5	7	-	12	20
Plywood*	7	12	3	22	1	2	-	3	11

*Discrepancy between plywood and lumber totals is due to some firms not using plywood.

decrease while the figure is only 3 for plywood. These figures are not unique for the Lansing area. Since 1950 national sales figures (for plywood) have increased over 500%. (See Table 12).

One of the largest industrial firms in the area recently reduced its lumber usage drastically by switching from wooden pallet boxes to collapsible wire mesh baskets for material shipments and intra-plant handling.

TABLE 12.--Douglas fir plywood production for selected years.

Year	Number of Plants	Plywood Production (in square feet)
1930	17	305,000,000
1940	25	480,000,000
1950	68	1,200,000,000
1955	111	5,075,189,352
1960	152	7,815,581,261

Source: Douglas Fir Plywood Association, Bulletin No. 2900.

Another case in point concerns a large manufacturer of material handling equipment that once used 5 to 6 million feet of lumber each year. Their 1959 usage totaled only 250,000 board feet and the lumber buyer estimates that by 1980 lumber will be completely replaced by steel, aluminum and other substitutes.

The third category of complaints concerns the actual production and distribution of the lumber. Most often listed as a complaint within this group was the shortage of a particular species or size. In some instances this shortage may be real; however, in other cases the inefficient and beclouded channels of distribution give rise to these "shortages." Poor promotional effort on the part of lumber producers and dealers was mentioned seven times as a reason for not utilizing native hardwoods. Three users mentioned they had "never been approached." One of these buys low grade softwoods in carload lots for crating purposes! Another individual mentioned that personnel within the lumber companies usually are unable to answer his questions and are generally less helpful and less sales-minded than metal salesmen are.

Complaints such as poor sawing at the mill, lumber being too wet, and poor service, are a direct result of the unfortunate state of Michigan's sawmill industry today. In 1954, Michigan had 2000 sawmills and 1900 of these were cutting

less than a million board feet annually. A native mill cutting 30,000 feet daily is considered large, but many western mills cut 150,000 feet in eight hours.⁴ Michigan's sawmills are small and inefficient today mainly because there just isn't enough timber available to support the present number of mills. In 1945, we had only 1400 mills but the volume cut was 16% higher than the 2000 mills produced in 1954.

So we have the situation today of many mills struggling for survival and few prospering. Michigan's mills are not presently dependable for carload quantities. If a user wishes to buy a car of native hardwoods he must call a series of mills and even then delivery is questionable. Lumber users as well as wholesale dealers generally find it much easier to make a single phone call and order a car of western or southern softwoods. Large outstate mills have another advantage in that many own their own timber land while Michigan producers must buy the cutting rights.

The small mills can't afford to buy dry kilns or the latest sawmill equipment which would result in better satisfied customers and increased volume. Most of the mills are inflexible, or suited for only a single type of sawing. The small mills often aren't well equipped to saw large logs and consequently

⁴Personal conversation with Mr. Earl Turner, a central Michigan lumber wholesale dealer.

much good lumber is wasted. Likewise, most mills, especially the larger ones, don't cut small logs efficiently. This is one of the reasons more aspen is not on the market at the present time.

Most small mills can't afford competent lumber graders and consequently lumber grading is usually a haphazard proposition on a mill to mill basis. One local user of Michigan hardwoods mentioned that the quality of crating lumber varies greatly from mill to mill. A large pallet manufacturer claimed that Michigan sawmills were, "wasting a heck of a lot of lumber," because they don't grade it. He mentioned that his "pallet grade" lumber was better than he needed, in that he often received clear hard maple and oak. He concluded by saying that Michigan sawmills should be required to grade their lumber.

By offering poorer quality lumber and unreliable service, the small inefficient mill hurts not only itself but also other more prosperous mills because the general reputation and price of the lumber will decline whenever a poor product is offered for sale.

Perhaps some of the reasons for the problems and complaints concerning Michigan hardwoods are now more apparent. Next, this analysis will briefly consider what can be done to eliminate some of the dissatisfaction concerning the use of native Michigan lumber.

PART III -- RECOMMENDATIONS

In review, it was found that the complaints and problems concerning Michigan hardwood usage fell into three main categories:

1. Those due to the inherent qualities of the wood.
2. Those having to do with economic factors or outside influences.
3. Those which were the fault of the lumber producers themselves.

Little, outside of better salesmanship and promotional effort, could reduce the dissatisfaction arising out of the first and second categories. Perhaps the biggest possible boost to the Michigan lumber industry would be in a successful promotional campaign. Michigan should be proud of her lumber industry and should let all interested parties know what she has to offer. A partial list of specific promotional needs follows:

1. A "Use Michigan Lumber" campaign should be instigated similar to the successful "Use Michigan Sugar" and "Buy American Made" slogans.
2. The advantages of hardwoods, such as high strength, beauty of grain, resistance to wear, etc. . . should be advertised. People are generally prone to associate only the actual hardness of the wood with hardwood lumber. Slogans like "Built to last a lifetime -- built with hardwood lumber" would do wonders to increase the general acceptance of hardwoods.
3. Aspen should be promoted as a valuable species. People today generally associate aspen with either deer food or a pulpwood source.

4. The "Hardness of oak" and the tendency of "elm to warp" should be advertised as being exaggerations. There would likely be more than a grain of truth in such promotional efforts.
5. Red oak should be promoted as a valuable wood for furniture. One local furniture manufacturer preferred oak, but he said people still tended to associate oak furniture with the heavy, crudely designed oak furniture of forty and fifty years ago.
6. There should also be promotional efforts made to advertise the advantages of wood over substitutes such as steel, aluminum, and corrugated paper. Of course, this is a national concern for lumber producers.

The individual sawmills don't have the time or money to even attempt to promote their product, while wholesalers and middlemen are finding it generally easier to sell softwoods. Maybe the only way for the individual sawmills to help their own cause is for them to band together and at least talk over their problems such as promotion. Perhaps where individually they are weak and inefficient, collectively they could eventually grow into a force that someday would be able to successfully promote the product that Michigan has to sell.

The idea for an association of small sawmills within Michigan goes back to 1942 when a group was formed but lasted only several years. Perhaps nothing would be gained from the establishment of an association of this type but this writer feels that here is the place to start. The link between

advisory groups such as the Forestry Division of the Conservation Department and University consultants and the small sawmills is a very weak one. Many fine recommendations have been made and more surely will be forthcoming, but only to deaf ears. Why talk about better aspen utilization through using smaller head rigs? Why talk about utilizing our increasing percentage of low quality hardwoods like beech and elm? Why give recommendations if each sawmill takes a "I'll leave it to the other guy" attitude? Another "must" for Michigan lumber producers is more consistent lumber grading practices. How can grading uniformity be established and then enforced without some sort of organizational arrangement?

It has not been the purpose of this study to arrive at a series of recommendations. The preceding observations have been derived from combining what this writer has read, opinions of those he has talked with, and his conclusions concerning the findings of this study. It is felt that an effort should be made to organize the small Michigan sawmills into a working group where they could mutually discuss their problems and then take whatever action they deemed necessary. In conclusion is a partial list of the benefits that could be derived from an organization of this nature:

1. The promotional needs of lumber producers could be better met by collective action.

2. Grading would be uniform between mills as NHLA grades, or a revised set of grading rules would be closely adhered to.
3. Minimum quality standards would be enforced which would soon result in a "higher quality" reputation for the members.
4. Members would be kept abreast of new techniques and improvements within the industry.
5. The possibility of large concentration yards having grading, drying, and shipping facilities could be discussed.
6. A closer link between governmental and university advisory groups and the small sawmill operator would arise.
7. Better relationships with wholesale lumber dealers would arise with the emergence of a united group of lumber producers potentially capable of supplying carload quantities of Michigan lumber.

PART IV -- BIBLIOGRAPHY

BIBLIOGRAPHY

1. Allen, Clifford, and Titus, Harold. Michigan Log Marks. Memoir Bulletin No. 4, 1942, Agricultural Experiment Station, Michigan State College, East Lansing, Michigan, 89 pp.
2. Cook, David B. Beech For Containers. Beech Utilization Series No. 7, Northeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, 1953, 13 pp.
3. Findell, Virgil E., et al. Michigan's Forest Resources. Station Paper No. 82, 1960, Lake States Forest Experiment Station, Forest Service, U. S. Department of Agriculture, St. Paul, Minn., 46 pp.
4. Fontanna S. G., et al. Wood Utilization Problems and Possibilities in Michigan. A report of the consultants to the Forest Products Research Committee of the Michigan Planning Commission, Lansing, Michigan, 1946, 22 pp.
5. Forest Products Laboratory. Nail-Holding Power of American Woods. Technical Note No. 236, U. S. Forest Service, Madison, Wisconsin, 1931, 4 pp.
6. Garland, Hereford. Inventory and Directory of Wood Using Industries of the Upper Peninsula of Michigan. Michigan Department of Economic Development, Lansing, Michigan, 1947, 99 pp.
7. Guilkey, Paul C. "Hardwood Resources in Michigan and Their Current and Potential Uses." Forest Products Journal. Nov., 1957, Forest Products Research Society, Madison, Wisconsin, Wisconsin, pp. 24-A, 25-A.
8. Maybee, Rolland H. Michigan's White Pine Era 1840-1900. Michigan Historical Commission, Lansing, Michigan, 1960, 55 pp.
9. McIntire, G. S. "100 Years of Michigan Forests," Michigan Conservation, March-April, 1957, Michigan Department of Conservation, Lansing, Michigan, pp. 2-8.

10. Michigan Department of Conservation, Division of Co-operative Forest Management, U. S. Forest Service, A Survey of Lumber Production and Markets for Low Grade Hardwoods in the Lansing, Michigan, Area. Cerca 1954, 8 pp.
11. Michigan Forest Industries Committee. Michigan Forest Facts. 1959 Edition, Detroit, Michigan, 15 pp.
12. Sands, Waldo. Aspen For Containers. Lake States Aspen Report No. 10, 1947, Lake States Forest Experiment Station, Forest Service, U. S. Department of Agriculture, St. Paul, Minn., 12 pp.
13. Smith, Norman F. "White Pine - Tree of Legend." Michigan Conservation. July-August, 1957, Michigan Department of Conservation, Lansing, Michigan, pp. 21-23.
14. Sullivan, Edward T. The Wooden Container Industry in Minnesota. Paper No.4044, Scientific Journal Series, Agricultural Experiment Station, University of Minnesota, 1958, 42 pp.
15. U. S. Department of Agriculture. Strength Properties of Woods. Technical Bulletin No. 158.
16. Warner, John R., and Tubbs, Carl H. Wood Pallets in the Minneapolis--St. Paul Area. Lake States Forest Experiment Station, Forest Service, U. S. Department of Agriculture, St. Paul, Minn., 1956, pp. 6, 7.
17. _____. Wood Use By Manufacturing Firms in Minneapolis and St. Paul. Station Paper No. 75, Lake States Forest Experiment Station, Forest Service, U. S. Department of Agriculture, St. Paul, Minn., 1956, 30 pp.

PART V -- APPENDIX

PART A

List of Firms Included in the Study:

Arens Sign Company
Assid Furniture Company
Atlas Drop Forge
Auto Air Industries
Barber Sign Company
Bean, John Division Food Machinery and Chemical Corp.
Capital City Lumber Company
Capital Pattern
Consolidated Industrial and Agricultural Chemical Company.
Davison Chemical Company
Demmer Tool and Die
Dyer Sign Company
East Lansing Manufacturing Company
Fisher Body Division - General Motors Corporation
Hebblewhite Kitchens
Industrial Metal Products Corporation
Industrial Pattern
Jet Die and Engineering Inc.
Lans Corporation
Lansing Company
Lansing Die Sinking Company
Lansing Foundry
Lansing Lumber Company
Lansing Pattern and Manufacturing Company
Lansing Tool and Die Company
Lundberg Screw Products Company
Metal Machining Company
Motor Wheel Corporation

Multi-Lead Tool and Engineering Company
Novo Pump and Engine Company
Nu-Way Industries
Oldsmobile Division-General Motors Corporation
Olofsson Corporation
Planet Corporation
Quality Advertising Company
Quality Industries
Rehabilitation Industries
Reo Division - The White Motor Company
Sarvis Manufacturing Company
State Lumber Company
Superior Brass and Aluminum Casting Company
Suburban Wood Products Company
Tranter Manufacturing Inc.
Universal Sign Company
Verhoeven Lumber Company
Warner and Swasey Company - Duplex Division
WHW Machine Tool Company
Wohlert Corporation
Wolverene Company

PART B

List of Firms Using 50,000 Board Feet or More

Company	Volume in Board Feet	Species	Sold By
Lansing Lumber Co.	1,800,000	990,000 White Fir 540,000 W. Hemlock 180,000 Oak 90,000 Redwood	Michigan Wholesale Lumber Dealer
Capital City Lumber Co.	1,000,000	600,000 Mixed Hdws 350,000 Oak 50,000 So. Yellow Pine	Michigan Sawmill (hardwoods) Michigan Wholesaler (S.Y.P. and So. Oak)
Verhoeven Lumber Co.	500,000	Mixed Hardwoods	Michigan Sawmill - Cuts about half himself
Reo Motors	450,000	213,750 Pond. Pine 213,750 White Fir 22,500 Mixed Hdws	Michigan Broker (softwoods) Michigan Sawmill (hardwoods)
Tranter Mfg.	360,000	White Fir	Michigan Broker
East Lansing Mfg. Co.	300,000	Mixed Hardwoods	Michigan Sawmill
Lansing Company	250,000	145,500 Oak 28,000 Mixed Hdws 36,375 So. Yellow Pine 40,125 Doug. Fir	Michigan Sawmill and Michigan Broker
Motor Wheel Corp.	200,000	190,000 So. Yellow Pine 10,000 Oak	Michigan Broker

PART B.---Continued

Company	Volume in Board Feet	Species	Sold By
John Bean Div. Oldsmobile Div.	180,000	112,500 Aspen 30,000 Oak 30,000 Spruce 7,500 Doug. Fir	Michigan Broker
	69,000	64,000 So. Yellow Pine 5,000 Mixed Hdwds.	Out-of-State Broker Michigan Retailers

PART C

Interview Guide for the Study of Lumber Purchases in the
Greater Lansing, Michigan Area, for the Year 1959.

Name of Firm _____ Date of Interview _____

Firm Address _____

Interviewee _____ Title _____

Number of Employees _____ Age of Firm _____

1. Uses of lumber by species: (Include dimension and blocking)

		Per cent	Per cent	Performance
	Use Category	tot. use	Species	of total
				- 0 +
a.	1.	_____	_____	_____
	2.	_____	_____	_____
	3.	_____	_____	_____
	4.	_____	_____	_____
b.	1.	_____	_____	_____
	2.	_____	_____	_____
	3.	_____	_____	_____
	4.	_____	_____	_____
c.	1.	_____	_____	_____
	2.	_____	_____	_____
	3.	_____	_____	_____
	4.	_____	_____	_____

2. In Question 1., if negative performance is indicated give reason why performance is unsatisfactory.

<u>Use Category</u>	<u>Species</u>	<u>Reasons Unsatisfactory</u>
a. _____	_____	_____
b. _____	_____	_____
c. _____	_____	_____
d. _____	_____	_____

3. Where non-local species are being used:

<u>Non-local species</u>	<u>Use category</u>	<u>Tried local</u>		<u>Which?</u>	<u>Results?</u>
		<u>Species?</u>			
		<u>Yes</u>	<u>No</u>		
a. _____	_____	_____	_____	_____	_____
b. _____	_____	_____	_____	_____	_____
c. _____	_____	_____	_____	_____	_____
d. _____	_____	_____	_____	_____	_____

4. When local species were not tried or used, reason was:
(Rate reason numerically by order of importance)

a. Required grade not available	_____
b. Required species not available	_____
c. Dependable supply not available	_____
d. Price was too high	_____
e. Other (explain and rate)	_____

5. From whom was lumber purchased:

a. Michigan sawmill _____	e. Outstate sawmill _____
b. Michigan broker _____	f. Outstate broker _____
c. Michigan wholesaler _____	g. Outstate wholesaler _____
d. Michigan retailer _____	h. Other (Specify) _____

6. Form and moisture content of lumber purchased:

<u>Form</u>	<u>% of total</u>	<u>Moisture Content</u>		
		<u>% Green</u>	<u>% Air dry</u>	<u>% K.D.</u>
a. Finished lumber	_____	_____	_____	_____
b. Rough lumber	_____	_____	_____	_____

7. Volume of lumber in board feet purchased in 1959 _____

8. Do you have wood waste? Yes No If so in what form?

Chips Slabs-edgings sawdust Other

Approximate yearly volume of waste _____

Is waste used? in plant by employees sold

burned Other (specify)

9. Do you expect your wood usage to: remain the same _____

decline _____% or increase _____% from 1960 to 1970?

10. Volume of plywood usage in square feet for 1959 _____

11. Do you expect your plywood usage to: remain the same _____

decline _____% or increase _____% from 1960 to 1970?

12. Additional comments:

13. 1959 Lumber purchases by species, grade, volume and thickness

Hardwood Species

Grades	Oak	Ash	Bass-wood	Elm	Aspen	H Maple	S Maple	Birch	Trop. Hd.wds.	Un- known	Other Misc.
<u>FAS</u> vol. th.											
Select vol. th.											
#1 Com. vol. th.											
#2 Com. vol. th.											
#3 Com. & Poorer vol. th.											
Mill Run vol. th.											
Un- known vol. th.											

13.--Continued

Softwood Species

Grades	S. Y P.	Pond. Pine	D. F. & Larch	Mixed Western	NA & SP	Nat. Pine	Native Mixed	Misc.	Unknown
FAS	vol. th.								
Select	vol. th.								
#1 Comm.	vol. th.								
#2 Com.	vol. th.								
#3 Comm. & Poorer	vol. th.								
Mill Run	vol. th.								
Un- known	vol. th.								

PART D

Folklore from Michigan's Logging Days:

'Ole Pete Bateese'

Ole Pete Bateese got chase one night
By wolf up by de Soo.
Dese wolf dey t'ree, four in de pack
And dey scare him tru and tru.

Pretty soon ole Pete climb up a tree;
He t'ink he stay awhile.
Dese wolf dey sit down in de snow
And lick dere chops and smile.

Pretty quick two wolf go trot away;
Pete t'ink de rest soon go
Pretty quick dese wolf come right straight back;
Pete's spirits dey sink low.

For w'at you t'ink dese wolf dey got?
Big beaver--one? No--two!
Dey set dem down beside dat tree
And say, "by gar, now chew."

Dose beaver start in chew dat tree;
Dey chew like beat de band.
Pete t'ink he soon be on de groun'
Unless he take a hand.

So Pete pull out his one-quart hooch
And let it run out slow.
It trickle down de trunk to where
Dose beaver chew below.

Dose beaver dey got drunk, by gar.
Dey don't see none too good.
Dey make mistake and chew de wolf
Instead of chew de wood.

Dose wolf run 'way, and Pete climb down
And sit down in de snow.
And cry and cry to t'ink for where
His one-quart hooch she go.

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