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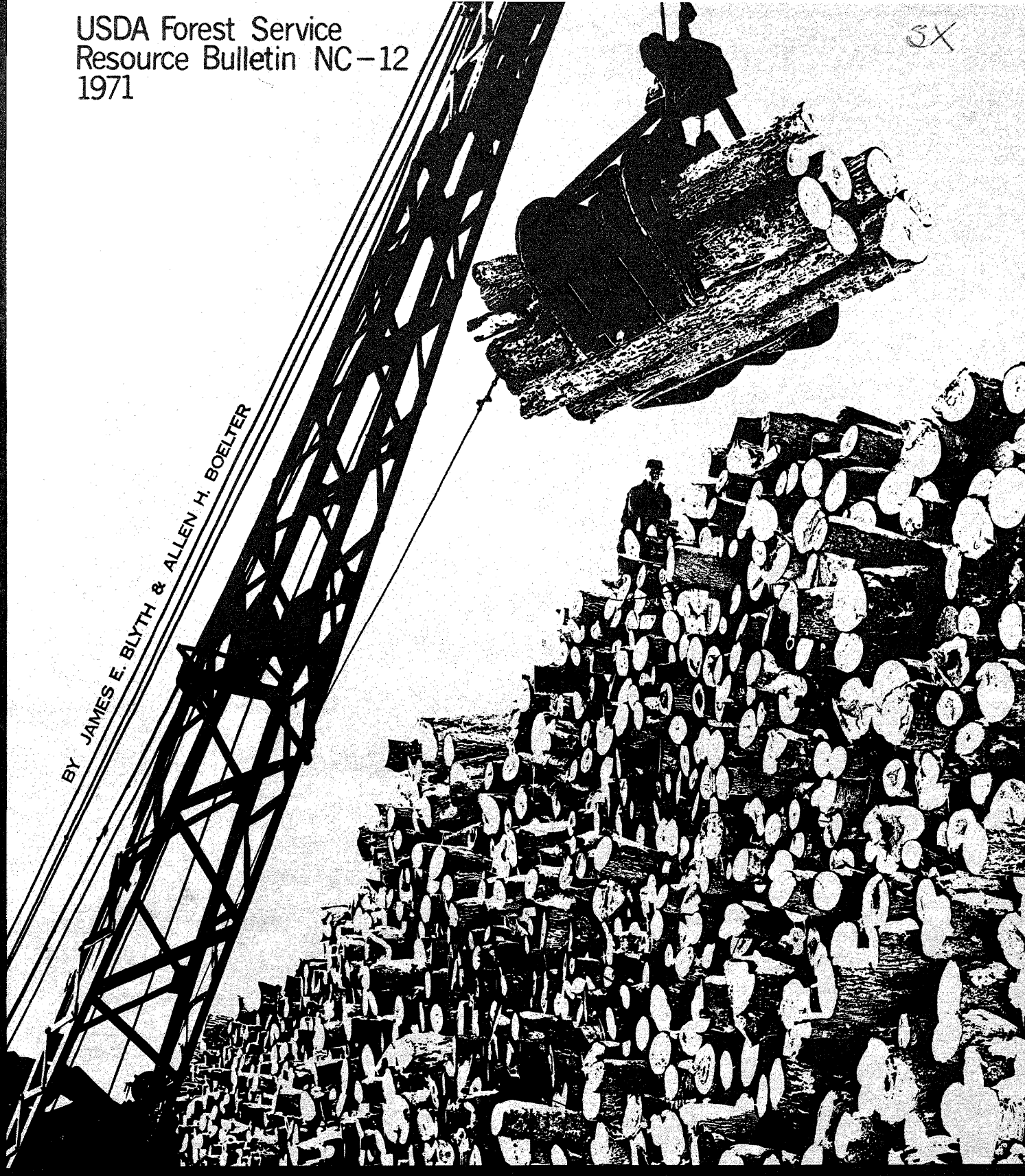

primary forest products industry & industrial roundwood production, Michigan, 1969

NORTH CENTRAL FOREST EXPERIMENT STATION • FOREST SERVICE • U.S. DEPARTMENT OF AGRICULTURE

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PRIMARY FOREST PRODUCTS INDUSTRY AND INDUSTRIAL ROUNDWOOD PRODUCTION, MICHIGAN, 1969

James E. Blyth and Allen H. Boelter

FOREWORD

Data for this publication came from a complete canvass of primary wood-using firms using Michigan logs and bolts. All canvassing in Michigan was done by the Forestry Division, Michigan Department of Natural Resources, using mail questionnaires and following up on nonrespondents by telephone or personal contact. The North Central Forest Experiment Station, using similar procedures, contacted out-of-State mills and received data from railroads operating in Michigan on the volume of logs loaded on cars in Michigan with a seaport destination. The Station edited and compiled the data.

RECENT TRENDS — FEWER MILLS BUT MORE OUTPUT

Michigan loggers cut 173.8 million cubic feet of industrial roundwood products in 1969, slightly less than in 1965 but 24 million cubic feet more than in 1954 (table 1). Ninety percent of the 1969 output was pulpwood and saw logs; the remainder was veneer logs, poles, commercial posts, piling, mine timbers, particleboard bolts, and cabin logs (table 2).

Output is shifting from softwoods to hardwoods. Softwoods constitute one-third of the volume in 1954

Table 1. — *Industrial roundwood production in Michigan, 1954, 1965, 1969*
(Million cubic feet)

Product	All Species			Softwoods			Hardwoods		
	1954	1965	1969	1954	1965	1969	1954	1965	1969
Pulpwood	61.7	103.8	93.2	28.6	33.9	28.0	33.1	69.9	65.3
Saw logs	62.6	57.2	62.9	15.7	5.7	7.4	46.9	51.5	55.5
Veneer logs	5.3	3.0	2.6	*	*	*	5.3	3.0	2.6
Poles & piling	.4	.2	.2	.2	.1	.1	.2	.1	.1
Mine timbers	3.7	1.2	1.0	2.5	1.1	1.0	1.2	.2	*
Posts 1/	2.8	3.6	3.0	2.8	3.6	3.0	--	--	--
Misc.	13.3	6.8	10.9	.6	.8	2.5	12.7	6.0	8.4
Total	149.8	175.8	173.8	50.4	45.2	42.0	99.4	130.7	131.8

* Less than 50 thousand cubic feet.
1/ Includes only posts processed at fence and treating plants.

Table 2. — *Volume of industrial roundwood production in Michigan, 1969*

Product	Standard units	Thousand standard units: All species	Soft-woods	Hard-woods	Thousand cubic feet: All species	Soft-woods	Hard-woods
Pulpwood	Standard cords	1,180	355	825	93,222	28,055	65,167
Sawlogs	Board feet 1/	426,068	51,181	374,887	62,930	7,418	55,512
Veneer logs	Board feet 1/	19,194	8	19,186	2,625	1	2,624
Piling	Linear feet	124	20	104	87	8	79
Poles	Pieces	8	8	--	68	68	--
Mine timbers	Cubic feet	980	955	25	980	955	25
Posts 2/	Pieces	2,918	2,918	--	3,000	3,000	--
Misc. 3/	Cubic feet	10,905	2,497	8,408	10,905	2,497	8,408
Total	--	--	--	--	173,817	42,002	131,815

1/ International 1/4-inch rule.
2/ Includes only posts processed at fence and treating plants.
3/ Includes cabin logs, shingle bolts, and particleboard bolts.

but slightly less than one-quarter in 1969. Technological changes in pulping processes allow large quantities of hardwoods to be pulped that were formerly unusable.

The number of active primary wood-using mills[1] declined rapidly from 1954 to 1969 (table 3). Meanwhile, wood receipts at these mills rose 14 percent (table 4). Decline in the number of mills is likely to continue but at a slower rate.

Table 3. — *Number of active primary wood-using plants in Michigan, 1954, 1965, and 1969*

Kind of plant 1/	1954	1965	1969
Pulpmills	11	10	9
Sawmills			
Large 2/	11	15	17
Medium 3/	85	107	103
Small 4/	1,296	266	187
Total	1,392	388	307
Veneer mills			
Face, core & speciality	4	4	6 5/
Container	19	8	6
Total	23	12	12
Charcoal	2	1	--
Misc.	102	26	19 6/
Grand Total	1,530	437	347

1/ Number of active small sawmills estimated for 1954.
2/ Annual lumber production in excess of 5 million board feet.
3/ Annual lumber production from 1 million to 5 million board feet.
4/ Annual lumber production less than 1 million board feet.
5/ One mill classified as a container veneer mill in 1965 is now classified as a specialty veneer mill.
6/ Includes 1 shingle mill, 3 log cabin plants, 1 particleboard plant, 2 treating plants, and 12 fence plants.

[1] *Mills receiving roundwood or chips from roundwood are primary mills.*

Primary plants are widely dispersed in the State (fig. 1). However, the larger mills tend to be concentrated in the north half of the Lower Peninsula and the Upper Peninsula near the largest timber supplies.

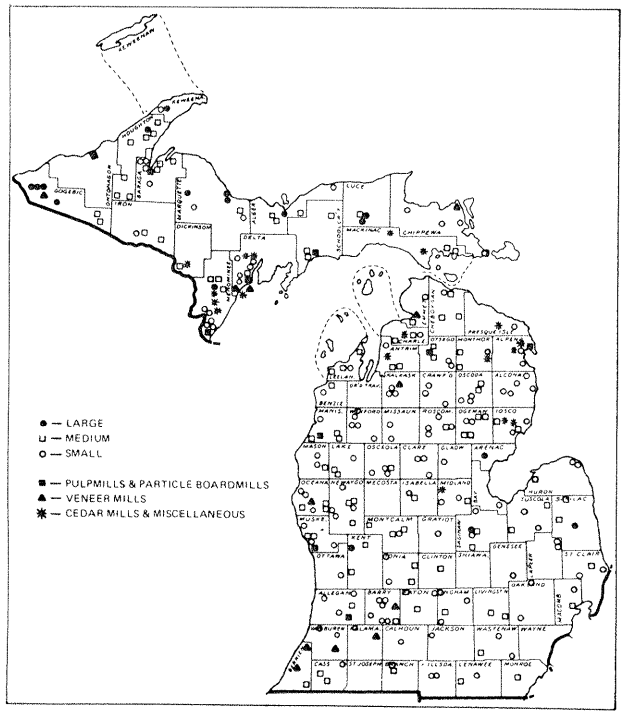


Figure 1. — *Primary wood-using plants in Michigan, 1969. Sawmills are classed by volume of lumber produced in 1969: large = 5 million board feet or more; medium = 1 to 4.999 million board feet; small = 100 to 999 thousand board feet. (Smaller sawmills not shown.)*

Table 4. — *Major industrial roundwood receipts by type of plant in Michigan, 1954, 1965, 1969*
(Million cubic feet)

Type of plant	All species			Softwoods			Hardwoods		
	1954	1965	1969	1954	1965	1969	1954	1965	1969
Pulpmills	32.3	65.2	54.1	14.5	17.7	12.1	17.8	47.5	42.0
Sawmills	70.3	57.4	62.3	16.5	5.7	7.8	53.8	51.7	54.5
Veneer mills	4.3	1.7	2.0	.1	*	--	4.2	1.7	2.0
Other mills1/	8.8	10.8	13.7	3.5	4.9	5.3	5.3	5.9	8.4
Total	115.7	135.1	132.1	34.6	28.3	25.2	81.1	106.8	106.9

* Less than 50 thousand cubic feet
1/ Does not include treating plants

Almost half of Michigan's industrial roundwood was cut in the Upper Peninsula (fig. 2). However, the proportion supplied by the Upper Peninsula has declined since 1954. Leading industrial roundwood producing counties, in descending order of volume, are Marquette, Menominee, Baraga, Iron, Lake, Luce, Delta, and Gogebic.

Although log and bolt shipments out-of-State are substantially larger than imports, the proportion of the harvest used internally is increasing.

PULPWOOD — HARDWOODS AND PLANT BYPRODUCTS BECOMING MORE IMPORTANT SOURCES

Michigan pulpwood cutting is shifting from softwoods to hardwoods (fig. 3). During the late 40's the hardwood-to-softwood cut ratio was 0.4 to 1; since 1965 the ratio has been 2.1 to 1. Volumewise, aspen is the most important pulpwood species followed by pine and mixed hardwoods[2]. During the last 23 years, mixed hardwood production has increased at the greatest rate[2].

Except for aspen, oak is the dominant hardwood pulpwood species cut in the Lower Peninsula. Pulpwood is an important outlet in the Lower Peninsula for scrub oak.

Pine pulpwood harvesting has climbed irregularly since 1946, with the greatest increase from 1955 to 1959 (fig. 4). At the same time, cutting of other softwoods, primarily spruce, balsam fir, and hemlock, fell sporadically. Overall, softwood pulpwood harvests have been erratic, ranging from about 300,000 to 600,000 cords annually since 1946.

Michigan sawmill and veneer mill byproducts (such as slabs, edgings, and veneer cores) have become an important pulpwood source in the last 4 or 5 years. Their use is likely to expand as average sawmill size increases, debarkers and chippers are installed, and wood waste disposal regulations become stricter.

Pulpwood output in Michigan has been increasing at more than 3.5 percent annually during the last two decades. This rate of increase will probably be larger during the next 3 or 4 years. However, the trend during the last two decades has been for a larger share of the pulpwood to be used in Michigan, while the annual volume shipped to Wisconsin has been erratic with no clear trend up or down.

Annual pulpwood production was the fifth largest in 1969, 17 percent below the peak in 1966. More than two-fifths of the pulpwood was shipped to Wisconsin mills; nearly half of this was aspen (table 5). These shipments, all from the Upper Peninsula, represented over one-fifth of Wisconsin's pulpwood requirements.

[2] *Mixed hardwoods include oak.*

Figure 2. — *Industrial roundwood output by species and county in Michigan, 1969, in thousand cubic feet. (Does not include poles, piling, or mine timbers.)*

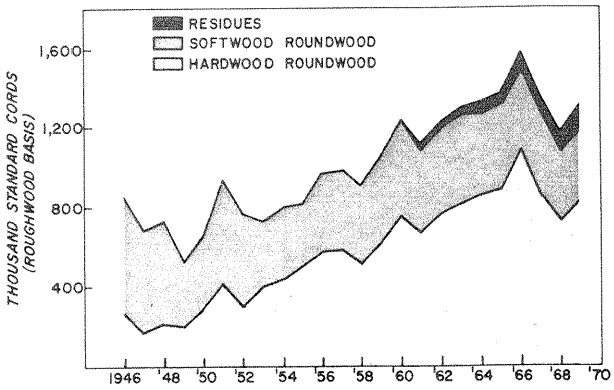


Figure 3. — *Pulpwood production trends in Michigan, 1946-1969.*

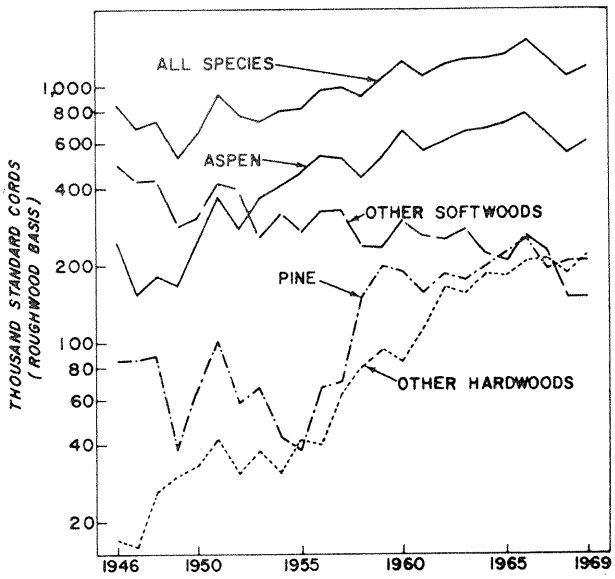


Figure 4. — *Round pulpwood production by species groups in Michigan, 1946-1969.*

Table 5. — *Michigan pulpwood production by species groups and destination, 1969*
(Thousand standard cords, roughwood basis)

Species	Destination of wood: Michigan	Wisconsin	Other States and Canada	Total
Roundwood: 1/				
Pine	116	91	--	207
Spruce	15	23	1	39
Balsam fir	19	24	1	44
Hemlock	2	61	--	63
Tamarack	--	2	--	2
Aspen	355	250	1	606
Oak 2/	80	--	--	80
Birch	22	1	--	23
Other hardwoods 3/	71	44	1	116
Total	680	496	4	1,180
Residues:				
Softwoods	--	5	3	8
Hardwoods	72	36	6	114
All material	752	537	13	1,302

1/ Includes chips from roundwoods.
2/ Excludes a small quantity of oak from the Upper Peninsula.
3/ Includes small quantity of oak from the Upper Peninsula.

Many companies buy pulpwood in the Upper Peninsula. Except for Keweenaw, each Upper Peninsula county furnished pulpwood for 10 or more plants in 1969 (fig. 5). Sixteen Wisconsin plants received pulpwood from this area.

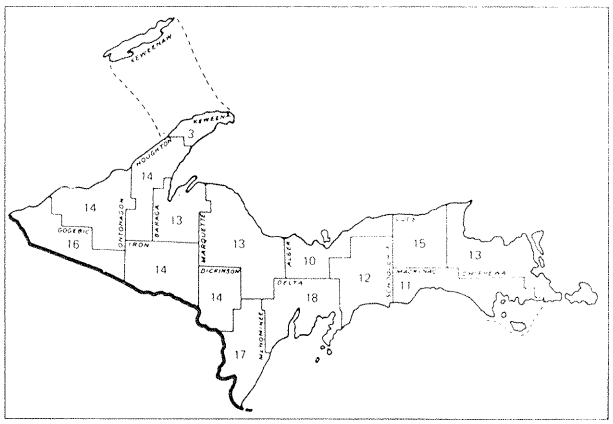


Figure 5. — *Number of plants receiving pulpwood from Upper Michigan Counties, 1969.*

Fifty-seven counties contributed to the 1969 pulpwood harvest (table 6). Counties furnishing more than 60,000 cords of pulpwood that year were Delta, Dickinson, Iron, Lake, Marquette, and Menominee.

Nine Michigan plants received 771 thousand cords of pulpwood in 1969; all but 19 thousand cords were from Michigan (table 7). Nearly half was aspen, 15 percent was pine, and 11 percent was byproducts from other primary wood-using mills.

Use of aspen, oak, and other hardwoods in Michigan has increased sharply in the last 20 years (table 8). Pine receipts dipped to a postwar low of 20 thousand cords in 1955 but have rebounded to 100 thousand cords or more annually since 1964. Spruce and other softwoods have declined in importance because some mills that used these species in the past are no longer operating.

A recent Michigan mill closing has nearly eliminated Canada as a source of pulpwood. By contrast, Canada supplied about one-third of Michigan's needs in 1948 and over 10 percent in 1967 (table 9).

Table 6. — *Pulpwood production from roundwood by county and species groups in Michigan, 1969*

(Thousand standard cords, roughwood basis)

County	Pine	Spruce	Balsam Fir	Hemlock	Tamarack	Aspen	Oak	Birch	Other hard-woods	All species
Alcona	1	--	*	--	--	35	7	2	4	49
Alger	7	1	1	1	--	2	1/	--	1	13
Allegan	--	--	--	--	--	*	1	--	*	1
Alpena	1	*	*	--	--	9	1	1	2	14
Antrim	--	--	--	--	--	2	*	*	*	2
Arenac	*	--	--	--	--	*	*	*	*	*
Baraga	6	1	*	11	*	23	1/	1	12	54
Benzie	*	--	--	--	--	9	1	1	1	12
Cheboygan	1	*	*	--	--	13	*	2	2	18
Chippewa	9	2	*	1	1	6	1/	*	2	21
Clare	3	--	--	--	--	25	3	2	4	37
Crawford	21	--	--	--	--	9	1	1	1	33
Delta	11	7	9	3	*	31	1/	*	2	63
Dickinson	2	5	2	2	1	52	1/	--	*	64
Gladwin	*	--	--	--	--	4	*	*	1	5
Gogebic	2	*	1	11	*	11	1/	*	8	33
Grand Traverse	2	--	--	--	--	10	3	1	*	16
Houghton	2	2	1	12	*	11	1/	*	2	30
Huron	--	--	--	--	--	2	--	--	--	2
Iosco	10	--	--	--	--	3	1	*	1	15
Iron	2	2	4	6	*	48	1/	--	14	76
Isabella	--	--	--	--	--	3	*	*	*	3
Kalamazoo	*	--	--	--	--	*	*	--	*	*
Kalkaska	3	--	--	--	--	9	1	*	1	14
Kent	*	--	--	--	--	--	--	--	--	*
Keweenaw	--	2	2	--	*	--	1/	--	--	4
Lake	12	--	--	--	--	20	25	1	11	69
Leelanau	--	--	--	--	--	1	--	*	--	1
Luce	17	3	3	2	*	2	1/	--	1	28
Mackinac	2	1	2	*	--	1	1/	*	1	7
Manistee	1	--	--	*	--	12	11	1	11	36
Marquette	24	6	4	3	*	23	1/	--	1	61
Mason	2.	--	--	--	--	2	2	*	*	6
Mecosta	*	--	--	--	--	15	1	*	3	19
Menominee	*	4	9	2	*	65	1/	1	2	83
Midland	*	--	--	--	--	5	*	*	*	5
Missaukee	1	--	--	--	--	8	1	*	1	11
Montcalm	*	--	--	--	--	4	2	*	2	8
Montmorency	7	1	*	--	--	18	5	2	2	35
Muskegon	1	--	--	--	--	1	--	--	2	4
Newaygo	2	--	--	--	--	9	4	*	6	21
Oceana	2	--	--	--	--	2	2	*	1	7
Ogemaw	3	--	--	--	--	3	*	*	1	7
Ontonagon	*	*	2	7	--	16	1/	--	1	26
Osceola	*	--	--	--	--	18	3	*	2	23
Oscoda	23	*	*	--	--	15	1	2	2	43
Otsego	2	--	--	--	--	*	--	--	--	2
Ottawa	*	--	--	--	--	*	--	--	*	*
Presque Isle	*	*	1	--	--	7	1	2	3	14
Roscommon	3	*	*	--	--	14	2	2	2	23
Saginaw	*	--	--	--	--	--	--	--	--	*
St. Joseph	--	--	--	--	--	*	*	--	*	*
Sanilac	--	--	--	--	--	*	--	--	--	*
Schoolcraft	13	2	3	2	*	12	1/	*	1	33
Tuscola	--	--	--	--	--	*	--	--	--	*
Van Buren	--	--	--	--	--	--	*	--	*	*
Wexford	9	--	--	--	--	16	1	1	2	29
Total	207	39	44	63	2	606	80	23	116	1,180

*Less than 500 cords.

1/ Oak is shown with other hardwoods in Upper Peninsula counties--the volume is not significant.

Table 7. — *Pulpwood receipts in Michigan by species groups and area of origin, 1969*
(Thousand standard cords, roughwood basis)

Species groups	Area of origin				Total
	Michigan	Wisconsin	Other States	Canada	
Roundwood[1/]					
Pine	116	--	--	--	116
Spruce	15	--	--	1	16
Balsam fir	19	--	--	--	19
Hemlock	2	--	--	--	2
Tamarack	--	--	--	--	--
Aspen	356	2	--	--	358
Oak	80	--	--	--	80
Birch	22	--	--	--	22
Other hardwoods	71	--	--	1	72
Total	681	2	--	2	685
Residues:					
Softwoods	--	--	--	--	--
Hardwoods	71	6	9	--	86
All material	752	8	9	2	771

1/ Includes chips from roundwood.

Table 8. — *Pulpwood receipts in Michigan for selected years, 1946-1969*
(Thousand standard cords, roughwood basis)

Year	Roundwood						Hardwood Residue	Total
	Pine	Spruce	Other softwoods	Aspen	Oak[1/]	Other[1/] hardwoods		
1946	85	133	121	69	--	8	--	416
1953	75	101	100	142	--	33	--	451
1960	128	94	87	431	11	59	--	810
1961	109	75	68	351	39	58	--	700
1962	97	29	35	387	41	90	--	679
1963	84	79	49	398	46	86	--	742
1964	107	68	40	429	49	96	2	791
1965	114	71	39	436	56	91	18	825
1966	143	78	49	526	61	106	41	1,004
1967	117	81	48	323	85	82	38	774
1968	133	61	38	328	59	99	56	774
1969	116	16	21	358	79	94	87	771

1/ Oak receipts from Upper Peninsula counties are included with other hardwoods--the volume is not significant.

Table 9. — *Pulpwood receipts in Michigan by area of origin, roundwood and residues, 1946-1969*
(Thousand standard cords, roughwood basis)

Year	Roundwood					Residues			Total
	Area of origin					Area of origin			
	Mich.	Wis.	Minn	Other states	Canada	Mich.	Wis.	Other states	
1946	259	--	12	--	145	--	--	--	416
1947	239	42	21	--	142	--	--	--	444
1948	270	--	22	1	191	1	--	--	485
1949	130	--	3	*	125	--	--	--	258
1950	258	--	3	--	122	--	--	--	383
1951	398	4	9	1	170	--	--	--	582
1952	290	5	1	2	151	--	--	--	449
1953	319	11	11	*	110	--	--	--	451
1954	309	*	4	*	99	--	--	--	412
1955	356	--	5	--	94	--	--	--	455
1956	437	--	7	--	91	--	--	--	535
1957	427	--	9	--	97	--	--	--	533
1958	458	--	7	--	84	--	--	--	549
1959	602	3	7	--	86	1	--	--	699
1960	727	*	*	--	83	--	--	--	810
1961	628	1	--	--	71	--	--	--	700
1962	677	1	1	--	--	--	--	--	679
1963	669	2	--	--	71	--	--	--	742
1964	728	1	--	--	59	3	--	--	791
1965	732	1	--	--	74	18	--	--	825
1966	862	3	*	1	97	40	--	1	1,004
1967	651	*	*	*	85	34	--	4	774
1968	653	3	*	*	62	49	1	6	774
1969	681	2	--	--	2	71	6	9	771

* Less than 500 cords

SAW LOG PRODUCTION STABILIZED — AVERAGE SAWMILL SIZE INCREASING

Saw log production in 1969 was little changed from 1954. Nearly 88 percent of the harvest in 1969 was hardwoods. Principal hardwood species cut are hard maple, red oak, aspen, and soft maple (table 10). Leading softwoods are white pine, hemlock and red pine.

Counties each furnishing more than 20 million board feet of saw logs in 1969 were Baraga, Marquette, Luce, Gogebic, and Alger, all in the Upper Peninsula. Top-producing counties for individual species were as follows (table 11): Baraga-hard maple, yellow birch, and hemlock; Newaygo-red oak and white oak; Gogebic-aspen and basswood; Saginaw-soft maple; Antrim-elm; Alger-beech; and Marquette-white pine.

Only 8 million board feet of saw logs were shipped out-of-State, primarily to Wisconsin. More than half the volume shipped to Wisconsin was aspen.

Michigan sawmills received 418 million board feet of saw logs in 1969 (table 12), of which less than 1 million board feet came from out-of-State.

Average lumber output per sawmill is increasing because some small mills are closing, some of the larger mills are increasing their efficiency, and most new mills are larger than the average. Output per mill in 1969 was five times greater than in 1954 and 30 percent greater than in 1965 (fig. 6).

Large sawmills, although few in number, are important contributors to total production. Seventeen large mills, each cutting more than 5 million board feet annually, produced 35 percent of Michigan's lumber in 1969 (fig. 7). On the other hand, 187 small mills, each producing less than 1 million board feet

Table 10. — *Michigan saw log production by species and state of destination, 1969*
(Thousand board feet, International ¼-inch rule)

Species	Michigan	Wisconsin	Indiana	Ohio	Other states	Total
White pine	19,991	937	--	--	--	20,928
Red pine	5,629	58	--	--	--	5,687
Jack pine	1,535	40	--	--	--	1,575
Spruce	568	99	--	--	--	667
Balsam fir	83	95	--	--	--	178
Hemlock	19,063	97	--	--	--	19,160
Tamarack	5	--	--	--	--	5
No. White-cedar	2,980	1	--	--	--	2,981
All Softwoods	49,854	1,327	--	--	--	51,181
White oak	19,580	--	44	--	9	19,633
Red oak	49,793	60	11	--	--	49,864
Yellow birch	20,271	462	--	--	--	20,733
Hard maple	105,683	1,034	100	35	13	106,865
Soft maple	30,948	134	3	12	--	31,097
Beech	22,258	29	19	4	--	22,310
Ash	10,138	14	--	--	7	10,159
Cottonwood	9,618	--	6	6	--	9,630
Aspen	38,483	4,655	--	--	--	43,138
Basswood	16,757	104	5	6	--	16,872
Yellow-poplar	493	--	--	--	--	493
Black walnut	547	--	62	--	--	609
Black cherry	2,389	11	--	--	--	2,400
Elm	28,891	124	--	--	--	29,015
Paper birch	4,983	129	--	--	--	5,112
Other hardwoods	6,954	--	1	--	2	6,957
All hardwoods	367,786	6,756	251	63	31	374,887
All species	417,640	8,083	251	63	31	426,068

Table 11. — *Saw log production by county and species groups in Michigan, 1969*
(Thousand board feet, International ¼-inch rule)

County	White pine	Red & Jack pine	Hemlock	Other soft-woods	White oak	Red oak	Yellow birch	Hard maple	Soft maple	Beech	Aspen	Basswood	Elm	Other hard-woods	All species
Alcona	33	219	--	19	13	365	50	11	85	5	699	16	522	132	2,169
Alger	1,444	60	2,522	5	--	49	1,745	8,758	990	5,141	4	73	169	605	21,565
Allegan	--	--	--	--	218	297	--	379	294	152	26	134	5	334	1,839
Alpena	4	22	--	82	1	150	--	5	85	2	180	2	301	88	922
Antrim	18	21	56	2	--	30	60	843	92	220	438	759	1,574	282	4,395
Arenac	--	15	--	--	46	203	--	30	105	15	586	15	250	369	1,634
Baraga	1,980	50	3,648	328	--	299	4,679	11,868	580	--	1,205	391	1,002	181	26,211
Barry	--	--	--	--	292	2,346	--	1,131	682	188	36	165	28	529	5,397
Bay	--	--	--	--	56	93	--	43	221	7	1	26	42	458	947
Benzie	--	--	3	--	12	113	--	144	2	290	73	140	404	111	1,292
Berrieu	--	--	--	--	150	380	--	160	190	50	--	90	--	190	1,210
Branch	--	--	--	--	369	661	--	551	503	136	--	153	20	368	2,761
Calhoun	--	--	--	--	470	1,112	--	345	582	190	--	159	20	442	3,320
Cass	--	--	--	--	606	1,244	--	467	410	270	--	247	10	705	3,959
Charlevoix	1	11	17	--	--	22	17	1,076	124	264	1,092	649	1,113	182	4,568
Cheboygan	32	76	15	15	--	280	8	388	164	145	2,991	177	867	592	5,750
Chippewa	687	335	55	267	--	5	139	711	92	241	287	74	86	66	3,045
Clare	--	--	--	--	11	140	--	15	90	3	501	30	266	38	1,094
Clinton	--	--	--	--	318	690	--	862	528	190	7	148	39	691	3,473
Crawford	89	338	4	2	50	426	5	45	110	5	870	75	425	37	2,481
Delta	601	304	135	322	--	6	217	550	264	180	260	37	278	322	3,476
Dickinson	272	23	463	56	--	8	181	1,363	120	88	701	620	415	388	4,698
Eaton	--	--	--	--	195	681	--	1,463	407	458	13	302	72	515	4,106
Emmet	3	--	19	--	25	21	24	414	24	307	340	91	389	137	1,794
Genesee	--	--	--	--	110	168	--	260	194	34	--	42	51	121	980
Gladwin	--	22	--	1	5	191	--	7	175	4	419	15	378	469	1,686
Gogebic	380	190	1,093	168	--	59	2,172	8,791	459	--	6,172	1,068	947	295	21,794
Grand Traverse	9	2	12	--	1	44	15	454	4	404	73	169	483	161	1,831
Gratiot	13	--	--	--	776	1,157	--	1,123	989	475	218	449	72	1,081	6,353
Hillsdale	--	4	--	--	177	282	629	150	88	67	--	90	13	119	1,619
Houghton	338	112	269	244	--	884	2,431	9,091	1,300	--	1,171	471	326	161	16,798
Huron	--	--	--	--	90	120	--	587	1,115	20	128	311	327	1,174	3,872
Ingham	--	--	--	--	637	1,563	--	877	1,102	219	22	384	75	958	5,837
Ionia	--	--	--	--	708	1,651	--	980	1,000	439	24	449	179	1,356	6,786
Iosco	91	93	--	5	269	373	--	60	231	30	1,493	123	770	824	4,362
Iron	1,125	114	482	74	--	56	1,208	4,671	330	2	503	541	608	276	9,990
Isabella	21	--	8	--	62	167	1	128	248	66	509	347	412	200	2,169
Jackson	--	--	--	--	404	652	398	362	431	155	--	95	13	318	2,828
Kalamazoo	--	--	--	--	182	576	--	408	333	109	72	98	92	283	2,153
Kalkaska	195	114	34	5	--	157	6	168	42	62	213	86	370	27	1,479
Kent	31	1	16	--	355	1,612	1	1,339	633	380	71	359	32	749	5,579
Keweenaw	930	--	1,700	214	60	70	1,018	3,300	200	--	450	150	250	70	8,412
Lake	90	40	3	--	822	2,577	--	230	323	142	217	136	693	164	5,437
Lapeer	--	--	--	--	616	494	--	714	452	89	--	115	61	775	3,316
Leelanau	3	2	135	15	36	827	8	1,837	75	1,919	382	859	1,178	579	7,855
Lenawee	--	--	--	--	411	634	--	203	242	22	--	84	43	187	1,826
Livingston	--	--	--	--	1,026	896	--	996	485	116	--	157	38	585	4,299
Luce	3,002	2,510	2,891	40	--	4	1,514	8,078	1,294	3,064	29	193	763	1,369	24,751
Mackinac	468	121	241	537	--	--	242	3,664	433	513	1,173	101	349	352	8,194
Macomb	16	--	--	--	79	67	--	10	55	--	--	8	24	16	275
Manistee	73	54	44	--	410	954	2	582	380	351	251	175	791	331	4,398
Marquette	5,768	334	1,723	68	50	531	2,331	10,211	1,236	1,036	747	838	588	577	26,038
Mason	18	6	4	--	201	788	2	371	455	132	235	144	287	126	2,769
Mecosta	26	--	--	--	172	349	--	40	55	5	70	27	73	79	896
Menominee	1,128	76	2,858	1,134	--	48	346	2,396	202	100	789	354	447	414	10,292
Midland	--	--	--	--	135	260	--	215	885	40	125	44	135	1,346	3,185
Missaukee	17	19	4	11	12	270	5	134	8	23	267	72	647	26	1,515
Monroe	--	--	--	--	16	536	--	--	10	--	--	--	--	5	567
Montcalm	41	--	1	--	350	1,234	3	303	510	78	446	487	43	740	4,236
Montmorecy	110	110	1	--	25	129	--	83	100	11	1,331	61	231	87	2,279
Muskegon	103	1	74	--	214	707	7	59	147	59	50	17	29	60	1,527
Newaygo	195	1	10	--	1,306	4,559	2	417	584	66	1,010	134	1,169	275	9,728
Oakland	--	--	--	--	613	564	--	485	278	58	12	72	21	251	2,354
Oceana	174	--	4	--	1,053	2,499	2	613	467	120	95	213	1,203	104	6,547
Ogemaw	20	54	--	3	97	954	2	31	130	33	4,376	49	893	680	7,322
Ontonagon	136	87	360	94	--	39	616	2,577	224	--	2,970	212	181	130	7,626
Osceola	23	17	42	--	425	643	17	300	121	153	760	146	1,077	181	3,905
Oscoda	182	528	--	9	102	994	--	9	93	3	2,463	12	542	311	5,248
Otsego	95	96	15	2	25	31	14	646	80	172	591	509	847	185	3,308
Ottawa	1	--	1	--	273	580	1	308	236	113	28	88	29	249	1,907
Presque Isle	48	25	--	85	--	196	--	36	--	9	810	2	347	277	1,835
Roscommon	63	210	--	5	--	1,368	--	31	25	20	798	27	465	108	3,120
Saginaw	41	--	1	--	1,174	1,446	--	764	1,473	315	4	427	134	1,607	7,386
St. Clair	26	--	--	--	350	458	4	449	393	111	7	85	74	433	2,390
St. Joseph	--	--	--	--	92	210	--	140	140	52	--	55	10	123	822
Sanilac	--	--	30	--	511	711	13	689	1,198	176	14	231	196	980	4,749
Schoolcraft	694	838	144	18	--	4	589	2,450	412	1,493	60	35	211	695	7,643
Shiawassee	--	--	--	--	129	207	--	214	173	30	--	56	22	127	958
Tuscola	2	--	--	--	1,022	1,623	--	1,113	1,114	365	991	467	427	3,451	10,575
Van Buren	64	--	10	--	135	216	--	200	216	85	24	72	--	295	1,317
Washtenaw	--	--	--	--	681	914	--	358	380	86	7	105	18	348	2,897
Wayne	--	--	--	--	321	682	--	335	247	45	--	49	416	170	2,265
Wexford	4	7	13	1	81	258	9	196	148	92	158	134	618	158	1,877
Total	20,928	7,262	19,160	3,831	19,633	49,864	20,733	106,865	31,097	22,310	43,138	16,872	29,015	35,360	426,068

Table 12. — *Saw log receipts in Michigan by species and State of origin, 1969*
(Thousand board feet, International ¼-inch rule)

Species	Michigan	Wisconsin	Indiana	Total
White pine	19,991	--	--	19,991
Red pine	5,629	--	--	5,629
Jack pine	1,535	--	--	1,535
Spruce	568	--	--	568
Balsam fir	83	--	--	83
Hemlock	19,063	227	--	19,290
Tamarack	5	--	--	5
No. white-cedar	2,980	--	--	2,980
All softwoods	49,854	227	--	50,081
White oak	19,580	--	50	19,630
Red oak	49,793	--	70	49,863
Yellow birch	20,271	2	--	20,273
Hard maple	105,683	17	60	105,760
Soft maple	30,948	--	50	30,998
Beech	22,258	--	40	22,298
Ash	10,138	--	20	10,158
Cottonwood	9,618	--	30	9,648
Aspen	38,483	--	--	38,483
Basswood	16,757	--	40	16,797
Yellow-poplar	493	--	--	493
Black walnut	547	--	10	557
Black cherry	2,389	--	10	2,399
Elm	28,891	--	--	28,891
Paper birch	4,983	--	--	4,983
Other hardwoods	6,954	--	20	6,974
All hardwoods	367,786	19	400	368,205
All species	417,640	246	400	418,286

annually, accounted for only 14 percent of the 1969 lumber output. Medium-size mills produced the remainder.

Lumber production peaked at about 5.5 billion board feet in 1889, declined to a record low of 160 million board feet in 1932, rebounded to a postwar high of 595 million board feet in 1946, and oscillated between 595 and 273 million board feet since then (fig. 8).

Since 1954 the number of active sawmills has declined rapidly. An estimated 1,392 mills were active in 1954 compared with 388 in 1965 and 307 in 1969. By contrast, the number of large sawmills has increased from 11 in 1954 to 17 in 1969. During these 15 years medium sawmills (1 to 5 million feet annually) have increased by 18.

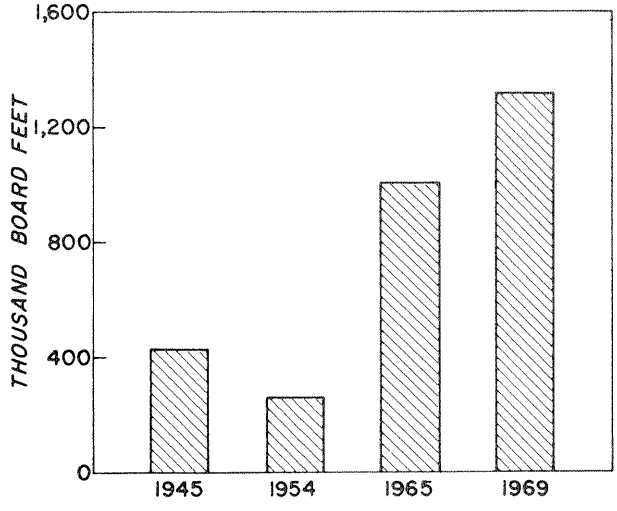


Figure 6. — *Average output per sawmill in Michigan.*

VENEER INDUSTRY ON A PLATEAU

Veneer log production dropped sharply from 1946 to 1958 but has been steady since then (fig. 9). Only one-fourth as much volume is harvested now as in 1946. Twenty years ago container mills were the greatest single user of veneer logs. Today container veneer logs constitute only one-seventh of the total veneer log output.

The container veneer industry had severe setbacks during the period of 1946-1958 as plastic and paperboard containers were substituted for veneer. Since then the industry has stabilized at a low output level.

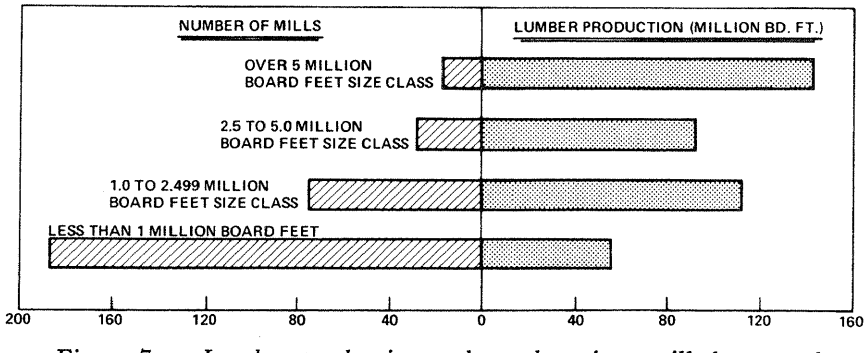


Figure 7. — *Lumber production and number of sawmills by annual production size class in Michigan, 1969.*

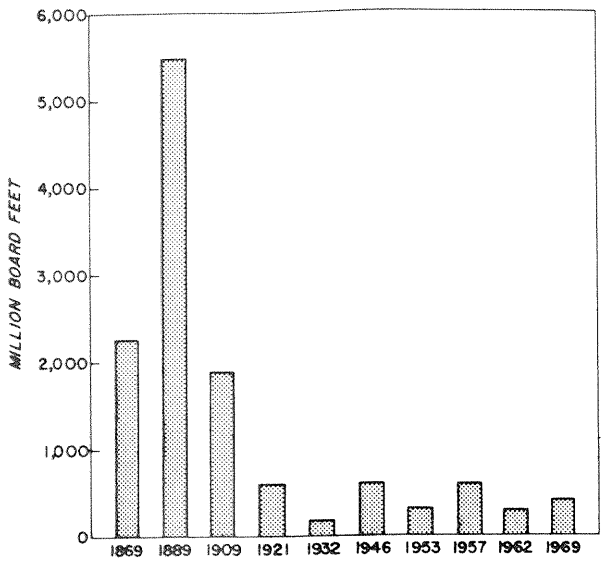


Figure 8. — *Lumber production in Michigan for selected years, 1869-1969. Sources: Lumber production in the United States 1799-1946, U.S. Dep. Agr. Misc. Public. 669, 1948; Lumber production and mill stocks, Annu. Rep. U.S Dep. Com. Bur. Census, Annu. Reports: 1953, 1957, 1962 and 1969.*

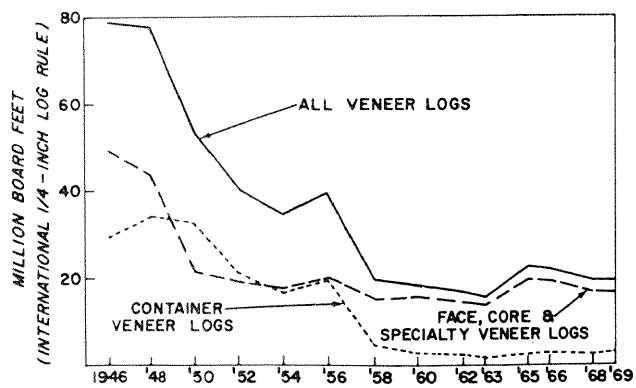


Figure 9. — *Veneer log production in Michigan for selected years, 1946-1969.*

Only six container veneer mills operated in 1969 compared with 19 in 1946.

Other types of veneer log output have followed a similar pattern of decline and stabilization. Face veneers are meeting stiff competition from plastic substitutes with wood grain finishes.

Elm, birch, and maple veneer log harvesting has declined greatly since 1946 (fig. 10). On the other hand, aspen veneer log production has recently increased significantly. A promising new use for aspen is in construction grade plywood. If this aspen product finds a ready market, aspen veneer log production will rise substantially.

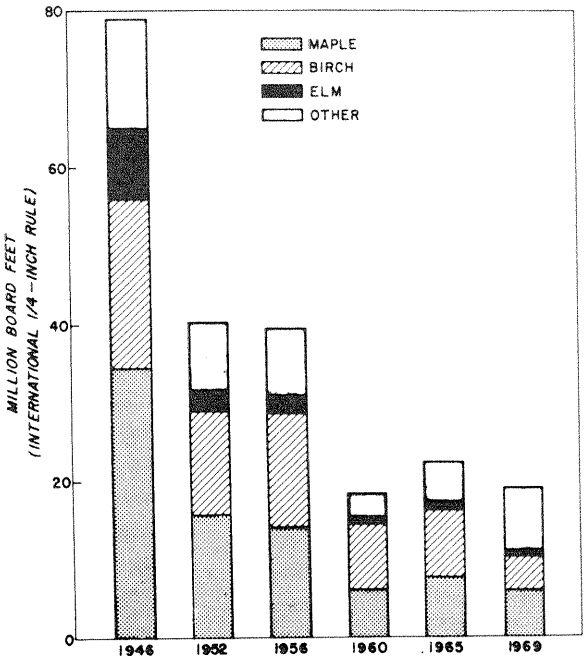


Figure 10. — *Veneer log production in Michigan for selected years, 1946-1969.*

Michigan is a net exporter of veneer logs. Wisconsin mills purchased 23 percent of the 19.2 million board feet of veneer logs cut in Michigan in 1969 (table 13). However, all container veneer logs were consumed in Michigan. Hard maple and yellow birch are important veneer species.

Only 2.3 million board feet of logs received at Michigan veneer mills in 1969 were from out-of-State; Wisconsin furnished two-thirds of them, Minnesota, Indiana, and Canada the remainder (table 14). Log receipts in the State were the largest on record since 1956 but only one-third of the 1946 total (fig. 11).

OTHER INDUSTRIES DIVERSE AND CHANGING

Other industrial roundwood products produced in Michigan in 1969 were poles, piling, mine timbers, shingle bolts, commercial posts, particleboard bolts, and cabin logs. Excluding mine timbers, 19 Michigan plants received 14 million cubic feet of these products

Table 13. — *Michigan veneer log and bolt production by species and State or country of destination, 1969*

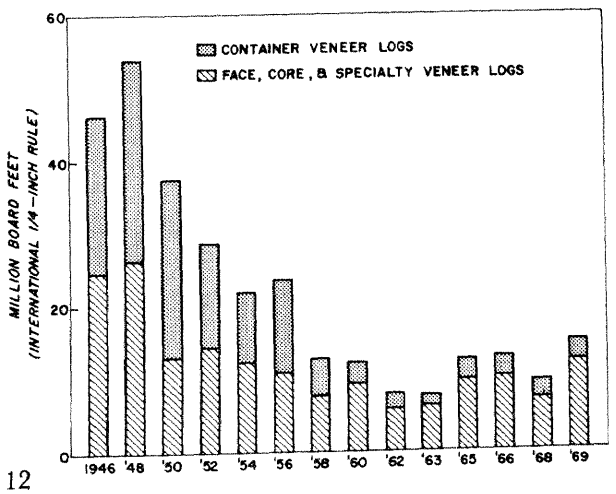
(Thousand board feet, International ¼-inch rule)

Species	Destination							
	Michigan	Wisconsin	Indiana	Ohio	Kentucky	Canada	Other countries	Total
White pine	--	8	--	--	--	--	--	8
White oak	42	--	22	--	28	45	--	137
Red oak	200	574	173	--	143	145	8	1,243
Yellow birch	2,434	834	--	--	--	--	--	3,268
Hard maple	2,020	2,757	605	184	111	--	37	5,714
Soft maple	302	65	--	--	--	--	--	367
Beech	457	4	--	--	--	--	--	461
Ash	279	8	--	--	--	2	--	289
Cottonwood	518	--	--	--	--	--	--	518
Aspen	4,014	--	--	--	--	--	--	4,014
Basswood	211	198	23	--	--	--	--	432
Yellow-poplar	24	--	--	--	--	--	--	24
Black walnut	--	--	184	--	34	15	117	350
Black cherry	257	1	19	--	--	8	8	293
Elm	767	45	24	--	--	--	55	891
Paper birch	902	25	--	--	--	--	--	927
Other hardwoods	236	--	21	--	--	1	--	258
All species	12,663	4,519	1,071	184	316	216	225	19,194

Table 14. — *Veneer log and bolt receipts in Michigan by species and State or country of origin, 1969*

(Thousand board feet, International ¼-inch rule)

Species	Michigan	Wisconsin	Minnesota	Indiana	Canada	Total
White oak	42	--	--	--	--	42
Red oak	200	--	--	--	--	200
Yellow birch	2,434	--	--	--	--	2,434
Hard maple	2,020	200	100	--	200	2,520
Soft maple	302	--	--	--	--	302
Beech	457	--	--	--	--	457
Ash	279	--	--	--	--	279
Cottonwood	518	--	--	59	--	577
Aspen	4,014	1,098	--	--	--	5,112
Basswood	211	--	--	--	--	211
Yellow-poplar	24	--	--	--	--	24
Black cherry	257	--	--	--	--	257
Elm	767	--	--	--	--	767
Paper birch	902	200	200	--	250	1,552
Other hardwoods	236	--	--	--	--	236
All species	12,663	1,498	300	59	450	14,970



in 1969. Particleboard manufacturing, one of the newer Michigan industries, is likely to expand and require more wood. The wood fence industry may also expand during favorable periods of business cycles and when housing starts are high.

Types of wood-using plants that have disappeared since 1946 include excelsior, charcoal, chemical wood, and clothespin manufacturers. Nonwood substitutes, plant obsolescence and competition from similar manufacturers in other States contributed to the closing of these types of plants.

Figure 11. — *Veneer log receipts in Michigan for selected years, 1946-1969.*

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SOME RECENT RESOURCE BULLETINS PUBLISHED BY THE NORTH CENTRAL FOREST EXPERIMENT STATION

Pulpwood Production and Consumption in the North Central Region, by County, 1967, by James E. Blyth. USDA Forest Serv. Resource Bull. NC-6, 23 p., illus. 1969.

Indiana's Timber, by John S. Spencer, Jr. USDA Forest Serv. Resource Bull. NC-7, 61 p. illus. 1969.

Pulpwood Production in the North Central Region, by County, 1968, by James E. Blyth. USDA Forest Serv. Resource Bull. NC-8, 22 p., illus. 1969.

The Growing Timber Resource of Michigan, 1966, by Clarence D. Chase, Ray E. Pfeifer, and John S. Spencer, Jr. USDA Forest Serv. Resource Bull. NC-9, 62 p., illus. 1970.

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Pulpwood Production in the North Central Region, by County, 1969, by James E. Blyth. USDA Forest Serv. Resource Bull. NC-11, 23 p., illus. 1970.

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- Conducting forest and range research at over 75 locations ranging from Puerto Rico to Alaska to Hawaii.
- Participating with all State forestry agencies in cooperative programs to protect, improve, and wisely use our Country's 395 million acres of State, local, and private forest lands.
- Managing and protecting the 187-million acre National Forest System.

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