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Pulpwood Production in the North-Central Region by County, 1987

James E. Blyth and W. Brad Smith



HIGHLIGHTS

Lake States

Pulpwood production dipped slightly to 7.69 million cords in 1987. Hardwoods comprised 78 percent of the total output. Nearly two-thirds—65 percent—of the hardwood roundwood was aspen. Eight percent of total production was whole-tree chips; aspen remained the preferred species. Production of pulpwood for pulp mills fell 2 percent, while production for particleboard mills climbed 5 percent. Pulpwood output dropped 2 percent in Michigan and Wisconsin, but rose 5 percent in Minnesota. Hard maple and white birch harvests reached record highs in Michigan. The pine harvest in Minnesota was the lowest on record. In Wisconsin, red pine production inched above jack pine for the first time.

Softwood residue imports to the Lake States from other States (primarily South Dakota and Wyoming) fell to 89 thousand cords. Wisconsin received 16 percent of its pulpwood requirements from out of State, while 7 percent of Michigan's pulpwood needs came from out of State.

Central States

Central States pulpwood production climbed 22 percent to 403 thousand cords. Two out of every three cords were residue from wood-using mills. Three out of every five cords were exported to five States adjacent to the Central States. Output increased in each of the Central States. Indiana was the leading producer with 44 percent of the total.

Receipts of pulpwood at Central States mills rose 20 percent to 165 thousand cords. Only 2 thousand cords were imported.

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Pulpwood Production in the North Central Region by County, 1987

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Pulpwood constitutes more than half the industrial timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri).

Current detailed information about pulpwood production¹ is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, and forest industry development. Also, scientists need current pulpwood information to plan research projects.

Since 1979, we have included logs, bolts, and wood residue used in manufacturing particleboard, waferboard, oriented strand board, and medium density fiberboard in this annual report. Together, these products are called particleboards, and all mills manufacturing these boards will be called particleboard mills in this paper. Wood used at particleboard mills is identical or nearly identical to wood used at pulp mills; therefore, including this wood in our study provides a more accurate estimate of demand for pulpwood-like material.

Because particleboard mills were in their infancy before 1979 and use primarily aspen and wood residue, including them does not distort roundwood use trends for other species nor preclude comparing 1987 survey results with those of 1978 and previous years.

Pulp and particleboard mills using North Central States timber in 1987 reported their pulpwood receipts² by species groups and counties of origin. This report presents the results of the survey, analyzes the data, compares results with those of 1986 or earlier years, and discusses trends in pulpwood production and use.

The Lake States and Central States are discussed separately because the timber types in each area are different, the

flow of wood between the areas is nominal, and less information can be released about the Central States (more detailed data on pulpwood production and receipts in the Central States would reveal the operations of individual mills). This is the 29th annual report of the pulpwood harvest in Lake States counties and the 28th annual report of the Central States harvest.

Several mills buy their pulpwood based on green tons rather than cords. Conversion factors used in the Lake States to convert green tons of pulpwood to standard cord equivalents are shown in the Appendix. Conversion factors used in the Central States are shown in footnote 1 of table 5.

Pulpwood production in Minnesota is completely and accurately shown. However, to prevent disclosure of confidential information about softwood pulpwood use by individual companies, the total quantity of softwood pulpwood imports and exports between Minnesota and Canada is not reported. *Thus, some Minnesota softwood shipped to Canada is shown as remaining and used in Minnesota, and receipts of Canadian softwood in Minnesota are understated.*

LAKE STATES

Production

Pulpwood production dropped slightly from a record 7.71 million cords³ in 1986 to 7.69 million cords in 1987 (table 1). Ninety-two out of every 100 cords produced were

¹Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut, plus the annual wood residue volume produced by sawmills, veneer mills, etc. used for pulp, particleboard, waferboard, oriented strand board, or medium density fiberboard.

²Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.

³All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.

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Table 1.--Production and imports of pulpwood, Lake States, 1987

(In standard cords, unpeeled)

Species and destination	Production by States ^{1/}				Imports			Total receipts
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S. ^{2/}	Canada	Total imports	
Cedar								
Michigan	45,934	--	--	45,934	--	--	--	45,934
Total	45,934	--	--	45,934	--	--	--	45,934
Balsam fir								
Michigan	87,655	--	1,293	88,948	--	--	--	88,948
Minnesota	--	104,598	3,626	108,224	--	--	--	108,224
Wisconsin	4,967	30	39,759	44,756	--	--	--	44,756
Exported ^{3/}	5,412	7,852	--	13,264	--	--	--	--
Total	98,034	112,480	44,678	255,192	--	--	--	241,928
Hemlock								
Michigan	35,053	--	72	35,125	--	--	--	35,125
Wisconsin	3,671	--	42,204	45,875	--	--	--	45,875
Total	38,724	--	42,276	81,000	--	--	--	81,000
Jack pine								
Michigan	187,908	--	157	188,065	--	--	--	188,065
Minnesota	--	71,896	5,281	77,177	--	--	--	77,177
Wisconsin	45,935	3,859	225,517	275,311	--	--	--	275,311
Exported ^{3/}	--	7,292	--	7,292	--	--	--	--
Total	233,843	83,047	230,955	547,845	--	--	--	540,553
Red pine								
Michigan	29,096	--	157	29,253	--	--	--	29,253
Minnesota	--	21,817	4,672	26,489	--	--	--	26,489
Wisconsin	5,509	2,112	229,024	236,645	--	--	--	236,645
Exported ^{3/}	--	521	--	521	--	--	--	--
Total	34,605	24,450	233,853	292,908	--	--	--	292,387
White pine								
Michigan	22,073	--	--	22,073	--	--	--	22,073
Minnesota	--	2,743	209	2,952	--	--	--	2,952
Wisconsin	1,936	--	23,659	25,595	--	--	--	25,595
Exported ^{3/}	--	521	--	521	--	--	--	--
Total	24,009	3,264	23,868	51,141	--	--	--	50,620
Spruce								
Michigan	67,270	--	461	67,731	--	--	--	67,731
Minnesota	--	74,468	563	75,031	--	--	--	75,031
Wisconsin	21,247	16,612	35,089	72,948	--	--	--	72,948
Exported ^{3/}	8,534	10,063	--	18,597	--	--	--	--
Total	97,051	101,143	36,113	234,307	--	--	--	215,710
Tamarack								
Michigan	21,594	--	--	21,594	--	--	--	21,594
Minnesota	--	7,542	--	7,542	--	--	--	7,542
Wisconsin	294	947	1,628	2,869	--	--	--	2,869
Total	21,888	8,489	1,628	32,005	--	--	--	32,005
Ash								
Michigan	20,083	--	2,199	22,282	--	--	--	22,282
Wisconsin	4,016	--	60,997	65,013	--	--	--	65,013
Total	24,099	--	63,196	87,295	--	--	--	87,295
Aspen								
Michigan	776,679	--	6,820	783,499	--	--	--	783,499
Minnesota	--	1,540,380	37,747	1,578,127	--	--	--	1,578,127
Wisconsin	120,036	25,830	1,052,838	1,198,704	--	--	--	1,198,704
Exported ^{3/}	--	11,876	--	11,876	--	--	--	--
Total	896,715	1,578,086	1,097,405	3,572,206	--	--	--	3,560,330
Balsam poplar								
Michigan	29,494	--	--	29,494	--	--	--	29,494
Minnesota	--	40,986	2,205	43,191	--	--	--	43,191
Wisconsin	104	--	104	208	--	--	--	208
Total	29,598	40,986	2,309	72,893	--	--	--	72,893
Basswood								
Michigan	42,416	--	5,834	48,250	--	--	--	48,250
Wisconsin	1,777	--	20,141	21,918	--	--	--	21,918
Total	44,193	--	25,975	70,168	--	--	--	70,168
Beech								
Michigan	50,049	--	357	50,406	--	--	--	50,406
Wisconsin	3,901	--	2,089	5,990	--	--	--	5,990
Total	53,950	--	2,446	56,396	--	--	--	56,396

(Table 1 continued on next page)

(Table 1 continued)

Species and destination	Production by States ^{1/}				Imports			
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S. ^{2/}	Canada	Total imports	Total receipts
White birch								
Michigan	158,588	--	50,637	209,225	--	--	--	209,225
Minnesota	--	1,284	--	1,284	--	--	--	1,284
Wisconsin	4,140	11,365	204,907	220,412	--	--	--	220,412
Total	162,728	12,649	255,544	430,921	--	--	--	430,921
Yellow birch								
Michigan	56,857	--	9,950	66,807	--	--	--	66,807
Wisconsin	7,976	--	20,949	28,925	--	--	--	28,925
Total	64,833	--	30,899	95,732	--	--	--	95,732
Elm								
Michigan	19,744	--	1,874	21,618	--	--	--	21,618
Wisconsin	144	--	28,094	28,238	--	--	--	28,238
Total	19,888	--	29,968	49,856	--	--	--	49,856
Hickory								
Michigan	864	--	--	864	--	--	--	864
Total	864	--	--	864	--	--	--	864
Hard maple								
Michigan	216,322	--	39,595	255,917	--	--	--	255,917
Wisconsin	38,450	--	175,397	213,847	--	--	--	213,847
Total	254,772	--	214,992	469,764	--	--	--	469,764
Soft maple								
Michigan	193,410	--	20,532	213,942	--	--	--	213,942
Wisconsin	14,636	--	137,141	151,777	--	--	--	151,777
Total	208,046	--	157,673	365,719	--	--	--	365,719
Red oak								
Michigan	108,403	--	5,498	113,901	--	--	--	113,901
Wisconsin	2,032	--	48,454	50,486	--	--	--	50,486
Total	110,435	--	53,952	164,387	--	--	--	164,387
White oak								
Michigan	33,283	--	--	33,283	--	--	--	33,283
Wisconsin	6	--	14,686	14,692	--	--	--	14,692
Total	33,289	--	14,686	47,975	--	--	--	47,975
Other hardwoods								
Michigan	14,968	--	3,220	18,188	--	--	--	18,188
Wisconsin	5,292	--	6,190	11,482	--	--	--	11,482
Total	20,260	--	9,410	29,670	--	--	--	29,670
Total roundwood								
Michigan	2,217,743	--	148,656	2,366,399	--	--	--	2,366,399
Minnesota	--	1,865,714	54,303	1,920,017	--	--	--	1,920,017
Wisconsin	286,069	60,755	2,368,867	2,715,691	--	--	--	2,715,691
Exported ^{3/}	13,946	38,125	--	52,071	--	--	--	--
Total	2,517,758	1,964,594	2,571,826	7,054,178	--	--	--	7,002,107
Residue, softwoods								
Michigan	64,801	--	38	64,839	--	8,608	8,608	73,447
Minnesota	--	43,627	7,800	51,427	--	--	--	51,427
Wisconsin	7,432	644	39,016	47,092	89,219	21,241	110,460	157,552
Exported ^{3/}	--	10,184	--	10,184	--	--	--	--
Total	72,233	54,455	46,854	173,542	89,219	29,849	119,068	282,426
Residue, hardwoods								
Michigan	137,240	--	12,292	149,532	19,250	2,499	21,749	171,281
Minnesota	--	57,260	--	57,260	--	--	--	57,260
Wisconsin	19,810	--	236,214	256,024	590	10	600	256,624
Exported ^{3/}	--	2,200	1,747	3,947	--	--	--	--
Total	157,050	59,460	250,253	466,763	19,840	2,509	22,349	485,165
All wood material								
Michigan	2,419,784	--	160,986	2,580,770	19,250	11,107	30,357	2,611,127
Minnesota	--	1,966,601	62,103	2,028,704	--	--	--	2,028,704
Wisconsin	313,311	61,399	2,644,097	3,018,807	89,809	21,251	111,060	3,129,867
Exported ^{3/}	13,946	50,509	1,747	66,202	--	--	--	--
Total	2,747,041	2,078,509	2,868,933	7,694,483	109,059	32,358	141,417	7,769,698

^{1/}Vertical columns of figures under the box heading "Production by States", present the amount of pulpwood cut in each State.

^{2/}Mostly western States.

^{3/}Pulpwood shipped to mills outside of region.

roundwood; the remainder was residue from wood-using plants.⁴

Major species harvested were aspen (3,572 thousand cords), jack pine (548 thousand cords), hard maple (470 thousand cords), and white birch (431 thousand cords). Other important species each supplying more than 200 thousand cords were soft maple, red pine, balsam fir, and spruce.

Hardwoods constituted 78 percent of total production. Hardwood pulpwood produced from Lake States wood residue rose to a record 467 thousand cords. For the fifth consecutive year pulpwood from this residue exceeded 400 thousand cords. Aspen dominated the hardwood roundwood harvest with 65 percent of the total. White birch, hard maple, and soft maple harvests also set record highs, of 431 thousand, 470 thousand, and 366 thousand cords, respectively.

Output from softwood roundwood was 100 thousand cords below the peak reached in 1982, but nominally below 1986. Pulpwood production from softwood residue rose 16 percent to a peak of 174 thousand cords. Major declines in jack pine and red pine output were partially offset by gains in hemlock, tamarack, spruce, and balsam fir.

Whole tree chip⁵ (WTC) production in the Lake States declined 5 percent to 605 thousand cords, 8 percent of total production. Compared to 1986, the WTC mix contained less aspen and other hardwoods and more softwoods. Slightly more than half of the chips were aspen. About 83 percent of WTC was produced in Michigan followed by 12 percent in Minnesota and 5 percent in Wisconsin.

Production of WTC by species group and State was:

State	Softwoods	Aspen	Other hardwoods
----- (Thousand cords) -----			
Michigan	90	222	193
Minnesota	—	72	—
Wisconsin	—	23	5

Michigan—Although Michigan's total production fell 2 percent to 2.74 million cords, hard maple and white birch output reached new highs. Declines in output were primarily in aspen, elm, soft maple, red pine, and red oak. The decline was concentrated in the Western Upper Pen-

⁴Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using mills that is used for pulping and particleboard. Residue includes slabs, edgings, veneer cores, sawdust, wood flour, and chips manufactured from slabs, edgings, and veneer cores

⁵Pulpwood produced from chipping entire trees (all portions of trees above ground, except the stumps).

insula Survey Unit; production climbed in only the Eastern Upper Peninsula Unit. Marquette, Delta, Menominee, Ontonagon, Dickinson, and Iron Counties were the leading roundwood producers.

Minnesota—Production expanded 5 percent to 2.08 million cords, a total exceeded only in 1984. All the major gains came in the Aspen-Birch Unit. Aspen output reached a record high for the fourth time in 6 years and accounted for 4 out of 5 cords of roundwood cut. The pine harvest was the lowest recorded. The jack pine cut fell to 83 thousand cords. St. Louis County supplied 3 out of every 10 cords of roundwood. Six counties—St. Louis, Itasca, Koochiching, Beltrami, Cass, and Lake—furnished nearly three-fourths (73 percent) of the roundwood.

Wisconsin—Wisconsin producers supplied 2.87 million cords in 1987, down 2 percent from 1986. Lower production was centered in aspen. Declines in output came in the Northeastern and Northwestern Survey Units. After peaking in 1981, the balsam fir harvest fell below the previous modern-day low, which occurred in 1953. Red pine cutting nudged above jack pine cutting for the first time to a record level. Other species at peak production were birch, hard maple, and soft maple with 286 thousand, 215 thousand, and 158 thousand cords, respectively. Wisconsin mills provided 250 thousand cords of hardwood residue for pulpwood for the first time. Top-producing counties were Bayfield, Marinette, Sawyer, Forest, and Lincoln.

In this report, we show the distribution of the harvest in two ways: first, the amount of pulpwood cut relative to the growing-stock volume in each of five major pulpwood species (fig. 1); and, second, the amount of pulpwood cut relative to commercial forest area (fig. 2). Pulpwood harvesting was most intensive in the following areas:

Species	Survey Unit
Jack pine	Northeastern and Central Wisconsin Eastern UP--Michigan
Red pine	Central Wisconsin
Spruce	Eastern UP--Michigan Aspen-Birch Unit of Minnesota
Balsam fir	Eastern UP--Michigan Northern Pine Unit--Minnesota
Aspen	Aspen-Birch, Northern Pine--Minnesota Northeastern, Northwestern Wisconsin Northern LP--Michigan

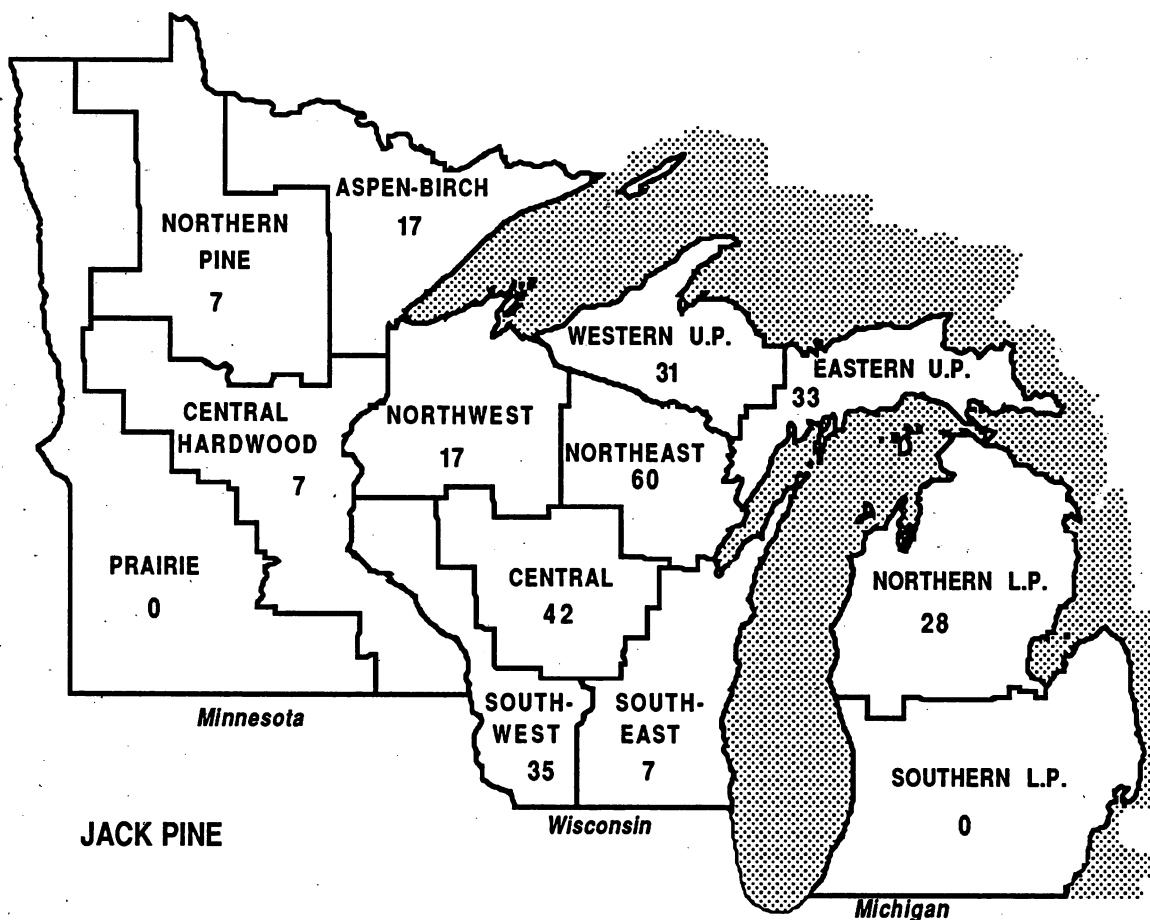


Figure 1.--Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of merchantable volume for each of five principal pulpwood species by Forest Survey Unit, 1987. Merchantable volume was determined during the last forest inventory in each State.

Receipts

Thirty-five wood pulp and 12 particleboard mills received 7.77 million cords of pulpwood in 1987, down 1 percent from 1986. Of 47 operating mills, 42 used aspen, 19 used birch, and 18 used maple (table 3).

Each of the Lake States furnishes many mills with pulpwood, including mills beyond the Lake States area. During 1987, Wisconsin supplied 29 mills, Michigan supplied 25 mills, and Minnesota supplied 22 mills.

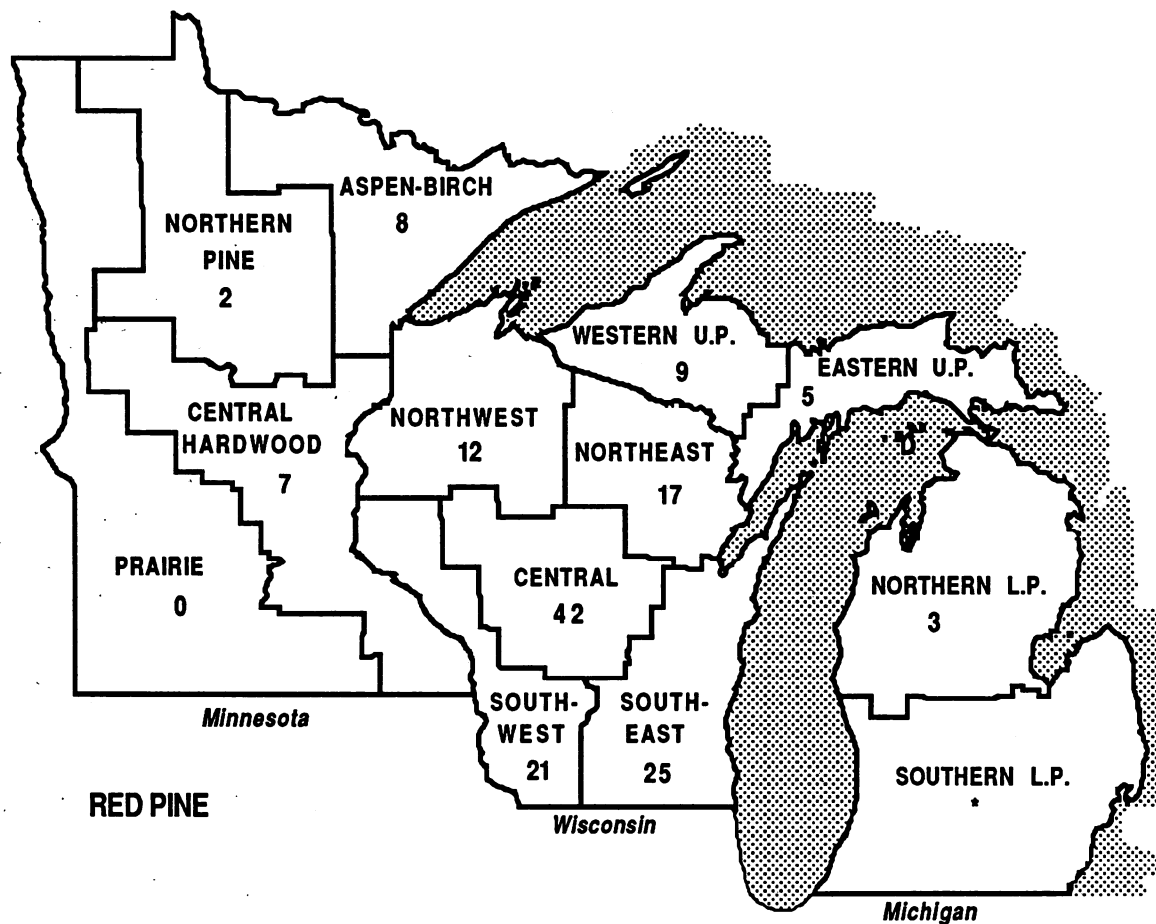
After falling to 12 thousand cords in 1984, softwood residue imports from Canada rebounded to 30 thousand cords in 1987. Shipments of softwood residue to the Lake States from other States declined for the fourth consecutive year to 89 thousand cords or about the level of the mid-1960's. South Dakota and Wyoming were the main suppliers of softwood residue from outside the Lake States.

Michigan—Out-of-State sources supplied 7 percent of the 2.61 million cords consumed by 11 Michigan mills. Wisconsin provided most of the imported wood. Primary imports were white birch, hard maple, and hardwood residue.

Wisconsin—Sixteen percent of the 3.13 million cords received at 22 Wisconsin mills came from out of State. Michigan supplied 313 thousand cords, Minnesota 61 thousand cords, other States (primarily Western) 90 thousand cords, and Canada 21 thousand cords. Principal imports were aspen, softwood residue, jack pine, hard maple, and spruce.

Minnesota—Minnesota pulpwood receipts are not fully reported (see earlier explanation).

(Figure 1 continued)



* Less than one-half cord

Industry Trends and Analysis

Pulp mills

Average daily wood pulp production was 12,010 tons per day in 1987 (table 4). Kraft mills accounted for one-third of the total production, and groundwood and other mechanical process mills accounted for another one-third.

Lake States pulpwood production for pulp mills in 1985, 1986, and 1987 was:

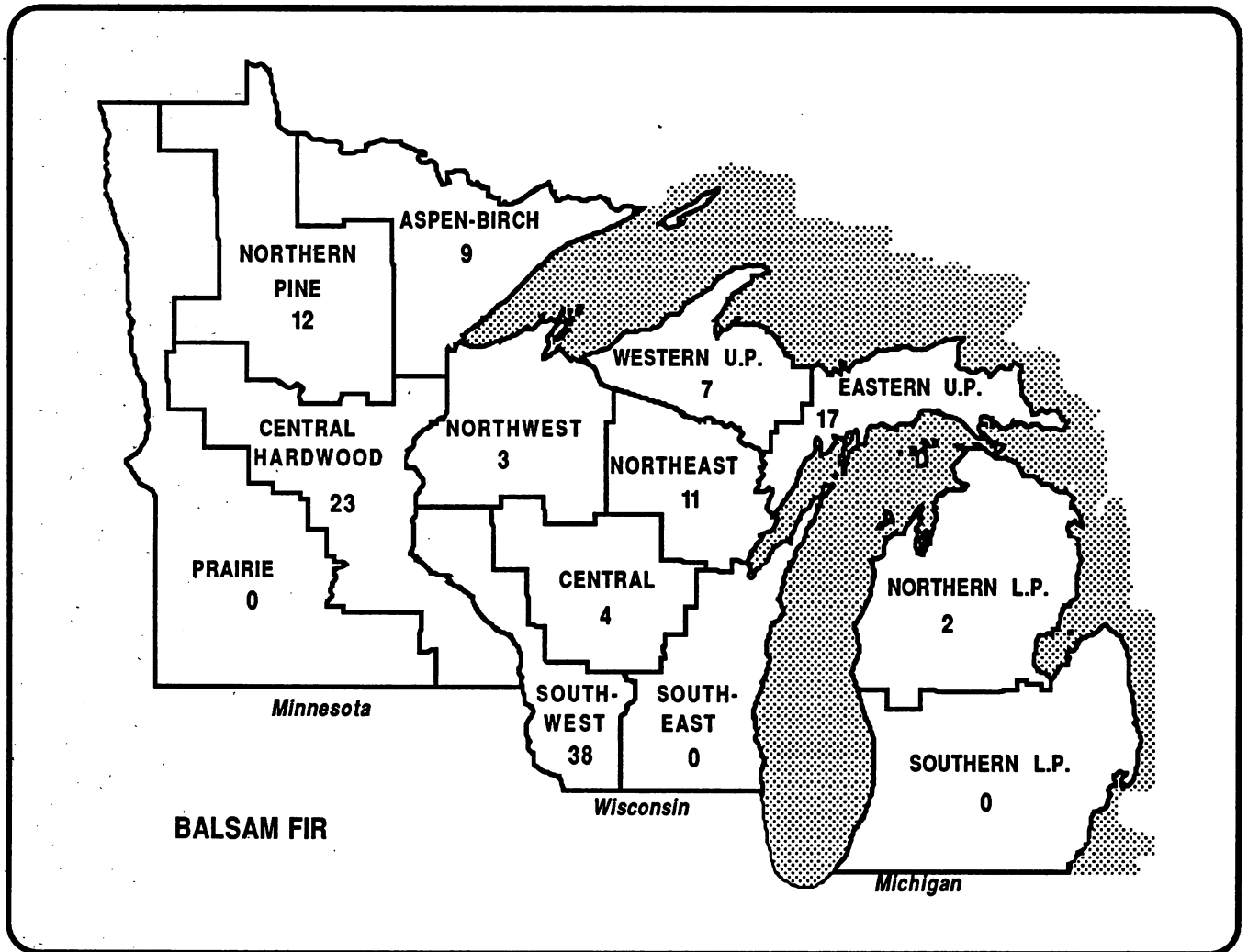
Species	Production		
	1985	1986	1987
	(Thousand cords)		
Roundwood			
Aspen	2,109	2,202	2,030
Other species	2,672	3,210	3,219
Residue	<u>452</u>	<u>470</u>	<u>524</u>
Total	5,233	5,882	5,773

The 2-percent drop in Lake States pulpwood production contrasts with the 5.1-percent climb in U.S. paper and paperboard production in 1987. A new Lake States mill began operating in late 1987, but two mills closed during 1986.

Particleboard mills

One new mill began wood procurement during 1987, although the mill did not begin operating until 1988. Annual production capacity of the Lake States particleboard mills was 1,330 million square feet as shown on the next page.

(Figure 1 continued)



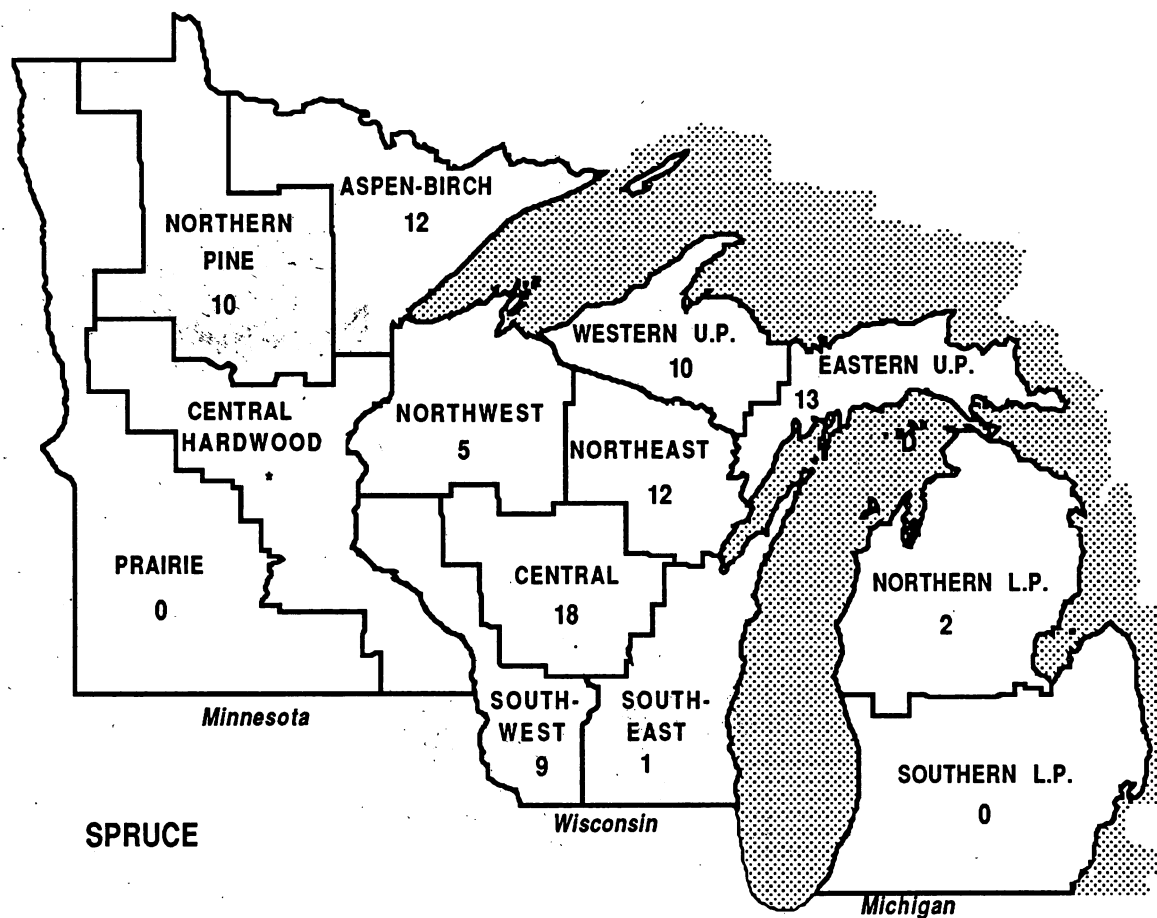
Company	Location	Capacity (Million square feet 3/4-inch basis)
Champion International Corp.	Gaylord, MI	175
Louisiana-Pacific	Newberry, MI	50
Louisiana-Pacific	Sagola, MI	140
Weyerhaeuser Co.	Grayling, MI	170
Louisiana-Pacific	Two Harbors, MN	75
Blandin Wood Products Co.	Grand Rapids, MN	150
Northwood Panelboard Co.	Bemidji, MN	130
Potlatch Corp.	Bemidji, MN	110
Potlatch Corp.	Cook, MN	105
Louisiana-Pacific	Hayward, WI	130
Rodman Industries	Marinette, WI	30
Weyerhaeuser Co.	Marshfield, WI	65
All companies		1,330

Lake States pulpwood production for particleboard mills in 1985, 1986, and 1987 was:

Species	Production (Thousand cords)		
	1985	1986	1987
Roundwood			
Aspen	1,302	1,455	1,542
Other species	215	259	263
Residue	93	117	116
Total	1,610	1,831	1,921

Demand strengthened for particleboard during 1987, and Lake States pulpwood production for particleboard rose 5 percent. Nationally, strong export and non-housing markets for particleboard more than offset slippage in residential construction. Housing starts fell 10.4 percent in 1987 to 1,617,100 units, the lowest since 1982.

(Figure 1 continued)



Looking ahead at least one pulp mill expansion should be completed in 1988 and two major pulp mill expansions should be completed in 1989. Another major pulp mill expansion should be finished in 1990, as well as a large expansion of a particleboard mill.

CENTRAL STATES

Production

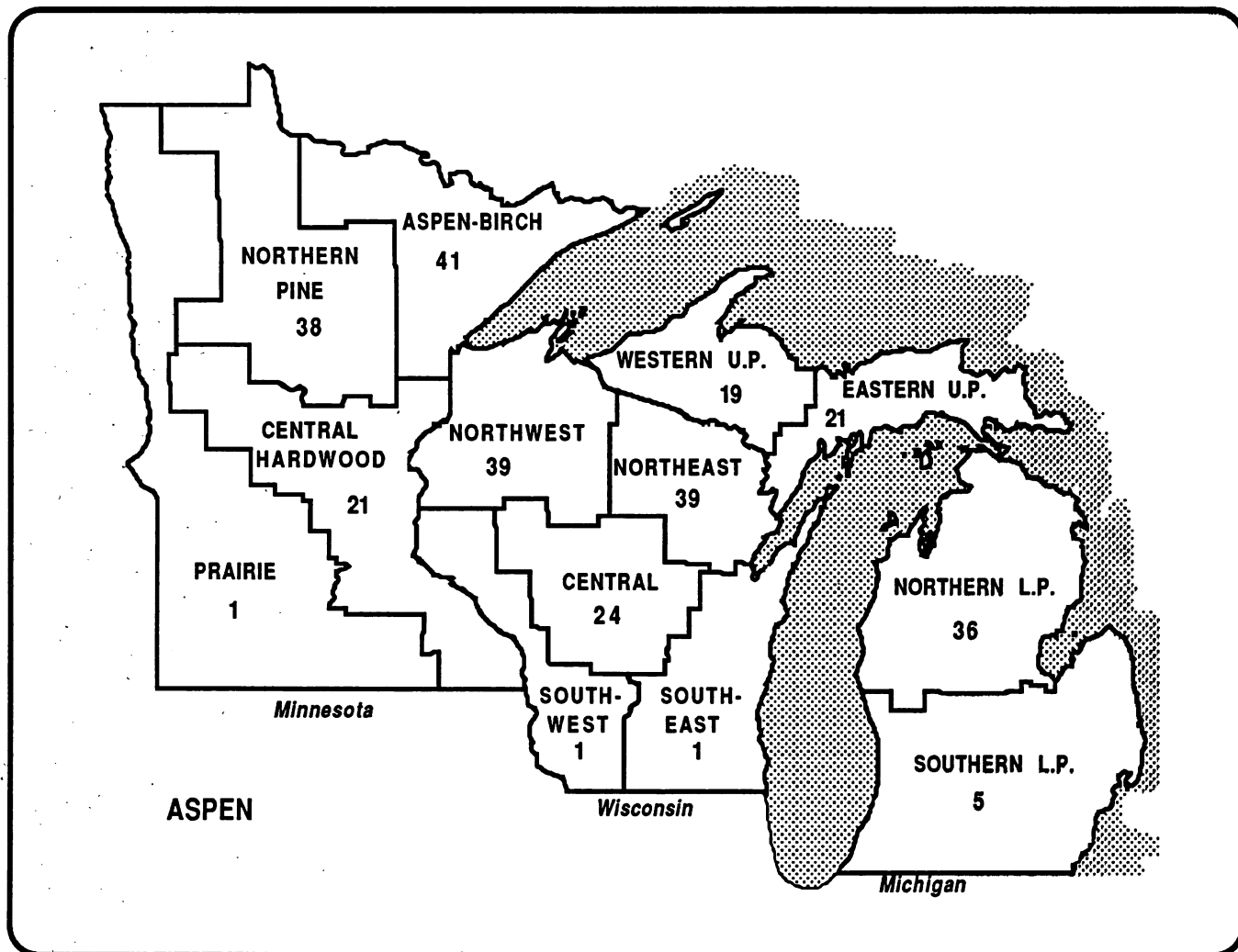
After plunging 18 percent in 1986, pulpwood production rebounded 22 percent to 403 thousand cords (table 5), the highest total since 1983. Two out of every three cords were residue. Output of soft hardwoods was the highest since 1979, after falling in 1986 to the lowest level ever recorded. Demand rose for hardwood residue and fell for hard hardwoods, softwoods, and softwood residue. Exports from the Central States (chiefly hardwood residue)

climbed to 240 thousand cords, 3 out of every 5 cords produced. Central States producers shipped wood to Kentucky, Michigan, Ohio, Wisconsin, and Oklahoma mills.

Each of the Central States produced more pulpwood than in 1986. Indiana led with 44 percent of the total, followed by Missouri with 27 percent, Illinois with 23 percent, and Iowa with 6 percent.

⁶ Hardwood species with an average specific gravity of 0.50 or less.

⁷ Hardwood species with an average specific gravity greater than 0.50.



Loggers harvested pulpwood in 26 central western, central eastern, and southern Illinois counties; 17 central western and southern Indiana counties; 14 northeastern, central, and southeastern Missouri counties; and 13 central eastern and southeastern Iowa counties (fig. 3). Producing areas expanded in central western Illinois, southeastern Iowa, central eastern Iowa, and northeastern Missouri, and they contracted in southern Illinois and southeastern Missouri.

Receipts

Three Central States pulp mills received 165 thousand cords in 1987 compared to 138 thousand cords in 1986. Gains in soft hardwood roundwood and hardwood residue more than offset the decline in hard hardwood roundwood receipts. Only 2 thousand cords of pulpwood were imported. No softwoods were used in the Central States for the fourth consecutive year.

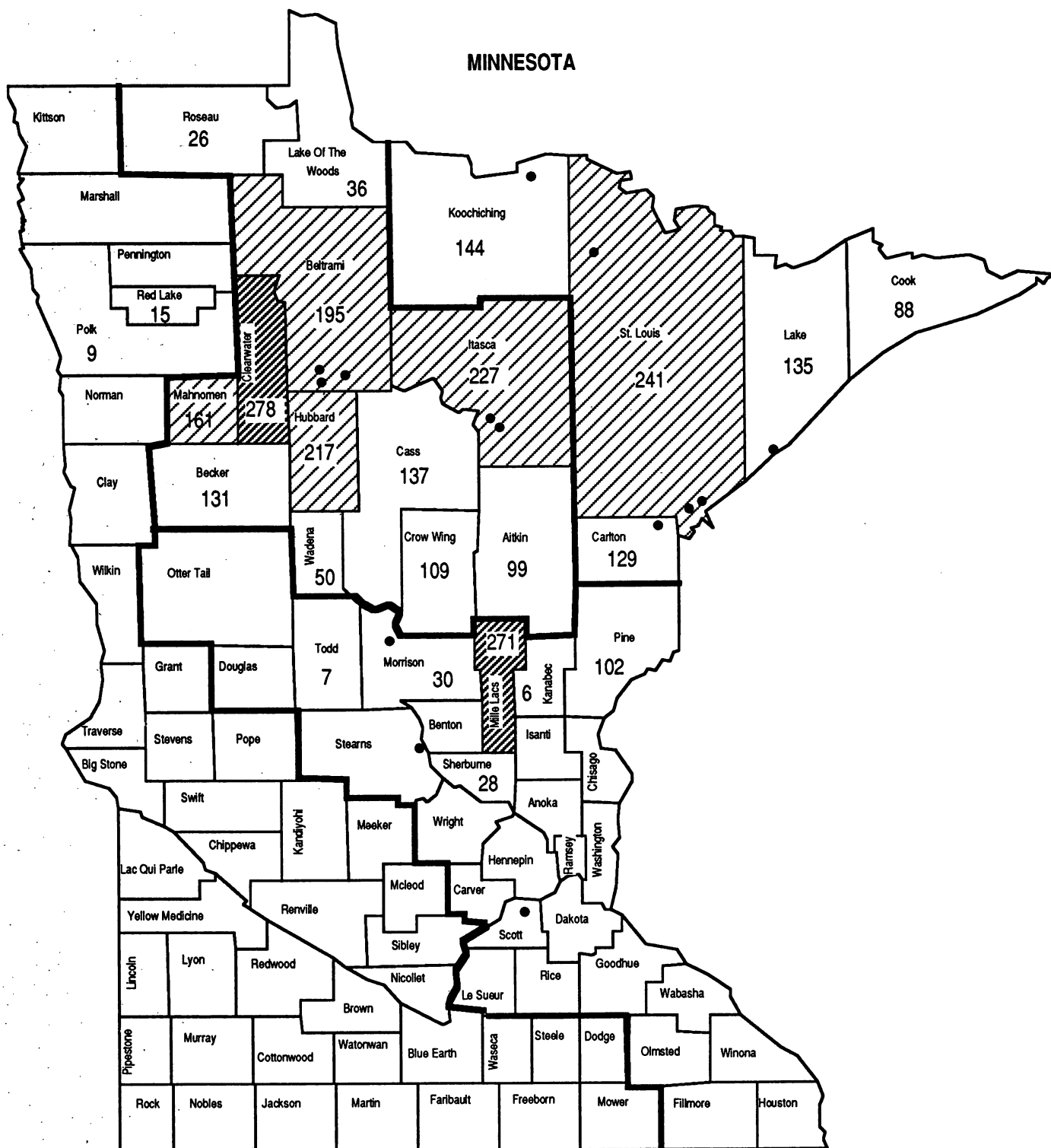
Industry Trends and Analysis

Average daily pulp production remained at 470 tons (table 6). No changes in average daily production are expected.

During the last decade annual pulpwood exports from the Central States ranged from 194 thousand cords in 1986 to a record 305 thousand cords in 1983 and averaged 247 thousand cords annually. Since 1979, annual exports have been between 56 percent and 71 percent of total pulpwood output. Mills in adjacent States will probably continue to be the principal markets for Central States pulpwood. Central States mills are likely to continue using nominal amounts of imported pulpwood.

Assuming no more Central States mills close, annual roundwood pulpwood output will probably range between 95 thousand and 125 thousand cords for the next 5 years.

MINNESOTA



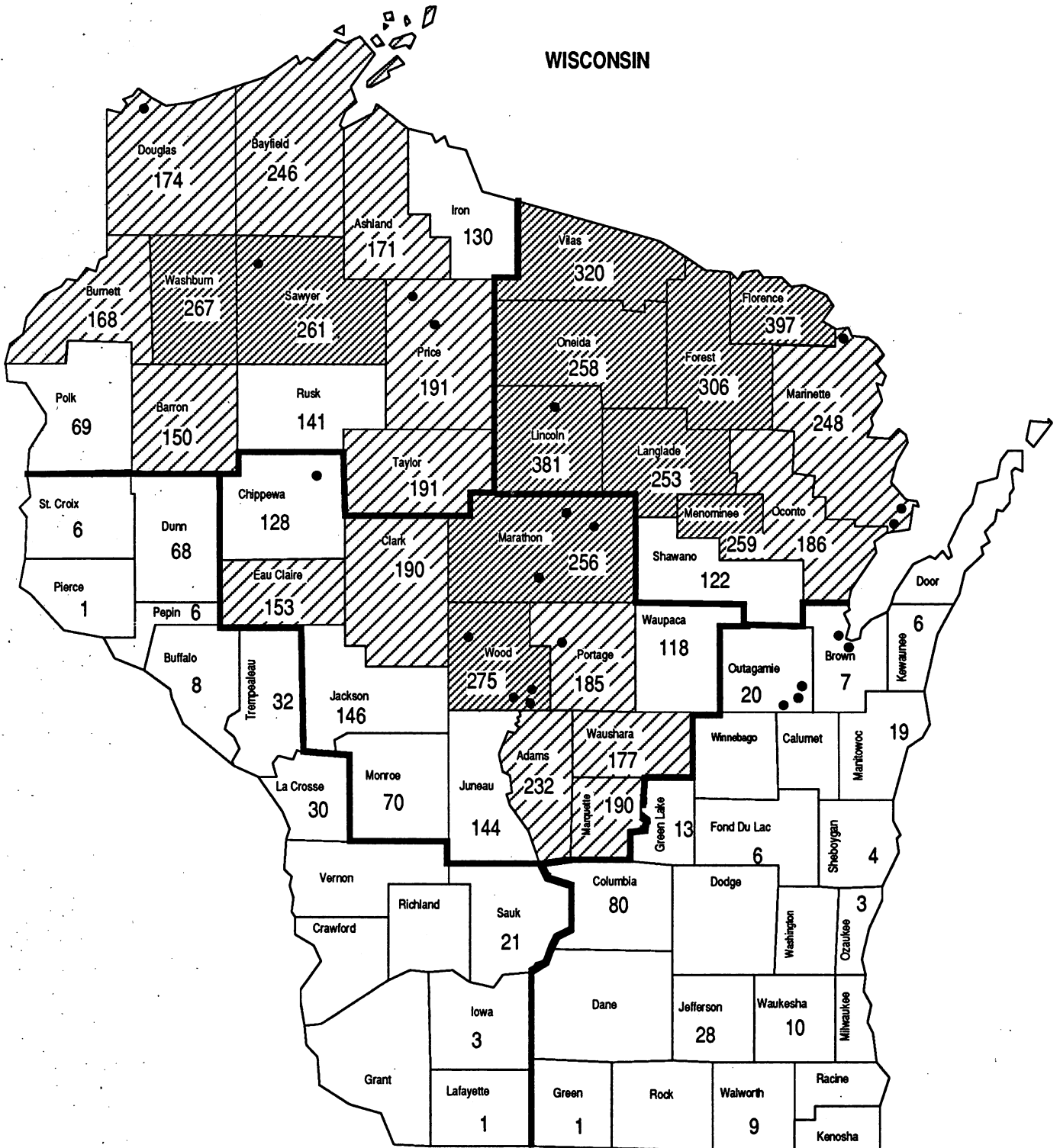
▨ 150-249 cords per 1,000 acres of timberland

● Pulp or particleboard mill

▩ 250 cords or more per 1,000 acres of timberland

Figure 2.--Cords of pulpwood cut per 1,000 acres of stocked timberland in principal pulpwood-producing counties, 1987. Acres of stocked timberland (stocking of trees greater than 16.7 percent) were determined during the last inventory in each State. Locations of active pulp and particleboard mills are shown.

WISCONSIN

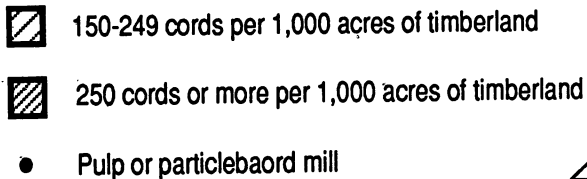


150-249 cords per 1000 acres of timberland

• Pulp or particleboard mill

250 cords or more per 1000 acres of timberland

(Figure 2 continued)



(Figure 2 continued)

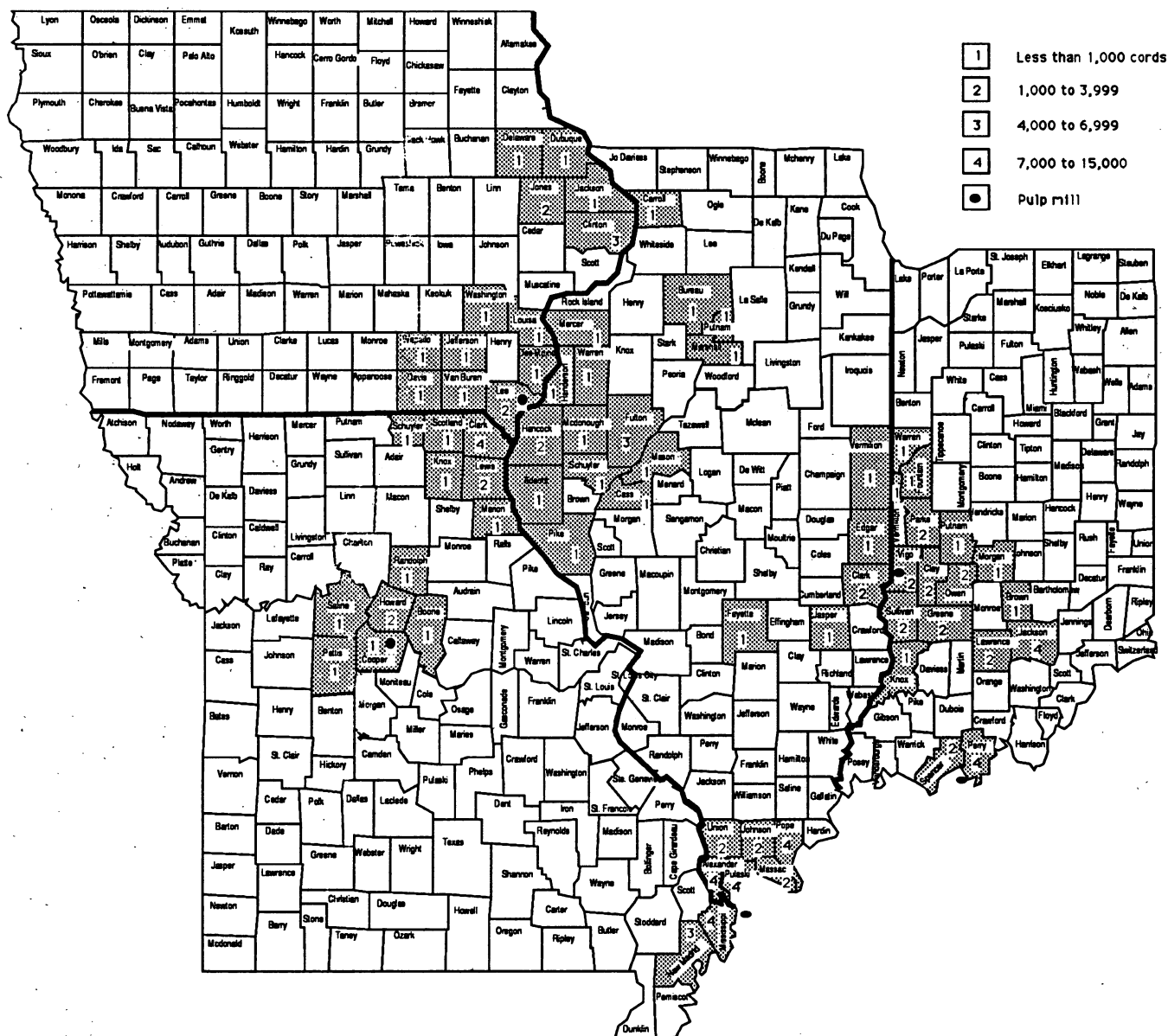


Figure 3.--Production of pulpwood from roundwood (including chips from roundwood) in the Central States by counties, in standard cords, 1987. Locations of Central States and nearby pulp mills using Central States pulpwood are shown.

APPENDIX

Conversion Factors Used In The Lake States

Standard cords of green roundwood per green ton:

Species	Factor
Cedar	0.6329
Balsam fir	.4688
Hemlock	.4150
Jack pine	.4688
Red pine	.4688
White pine	.4777
Spruce	.5014
Tamarack	.4291
Ash	.4330
Aspen	.4291
Balsam poplar	.4083
Basswood	.5167
Beech	.3956
White birch	.4018
Yellow birch	.3723
Cottonwood	.4291
Elm	.4018
Hickory	.3701
Hard maple	.3617
Soft maple	.4083
Red oak	.3444
White oak	.3723
Other species	.4688

Table 2.--Pulpwood production by major species groups, Lake States, 1987

(In thousand cords, unpeeled)

Species group	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Roundwood				
Softwoods	1,540	594	333	613
Hardwoods				
Soft hardwoods ^{1/}	4,679	1,406	1,631	1,642
Hard hardwoods ^{2/}	835	518	--	317
Total hardwoods	5,514	1,924	1,631	1,959
Total roundwood	7,054	2,518	1,964	2,572
Residue				
Softwoods	173	72	54	47
Hardwoods	467	157	60	250
Total residue	640	229	114	297
All material	7,694	2,747	2,078	2,869

^{1/} Hardwood species with an average specific gravity of 0.50 or less.^{2/} Hardwood species with an average specific gravity greater than 0.50.

Table 3.--Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard in 1987

Species and kind of material	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Aspen	42	11	13	18
Balsam fir	13	3	5	5
Birch	19	7	1	11
Hemlock	7	1	--	6
Pine	12	4	3	5
Spruce	15	3	6	6
Tamarack	6	1	2	3
Maple	18	9	--	9
Oak	16	8	--	8
Other hardwoods	24	9	6	9
Softwood residue	13	3	2	8
Hardwood residue	18	8	1	9
Total plants ^{1/}	47	11	14	22

^{1/} Some plants use more than one species, so numbers in columns are not additive.

Table 4.--Average daily production of active woodpulp mills in the Lake States by mill, location, and type of pulp produced, 1987

(In tons per 24 hours)^{1/}

Company	Location	All types	Type of pulp			
			Sulfite	Kraft	Groundwood and other mechanical	Semi- chemical
Michigan						
Abitibi-Price, Inc.	Alpena	430	--	--	430	--
Champion International	Quinnesec	750	--	750	--	--
Stone Container	Ontonagon	575	--	--	--	575
Mead Corp.	Escanaba	800	--	600	200	--
Menasha Corp.	Otsego	300	--	--	--	300
Packaging Corp. of America	Filer City	600	--	--	--	600
Warren Co., S.D.	Muskegon	250	--	250	--	--
Total	7 mills	3,705	--	1,600	630	1,475
Minnesota						
Blandin Paper Co.	Grand Rapids	300	--	--	300	--
Lake Superior Paper Industry	Duluth	440	--	--	440	--
Hennepin Paper Co.	Little Falls	75	--	--	75	--
Boise Cascade Corp.	International Falls	400	--	400	--	--
Potlatch Corp.	Cloquet	520	--	520	--	--
Superwood Corp.	Bemidji	100	--	--	100	--
Champion International	Sartell	385	--	--	385	--
Superwood Corp.	Duluth	350	--	--	350	--
Certain-Teed Corp.	Shakopee	80	--	--	80	--
Total	9 mills	2,650	--	920	1,730	--
Wisconsin						
James River Corp.	Green Bay	160	160	--	--	--
Weyerhaeuser Co.	Rothschild	200	200	--	--	--
Badger Paper Mills	Peshtigo	120	120	--	--	--
Appleton Papers, Inc.	Combined Locks	200	--	--	200	--
Consolidated Papers, Inc.	Stevens Point	270	--	--	270	--
Consolidated Papers, Inc.	Wisconsin Rapids	1,235	--	680	555	--
Green Bay Packaging, Inc.	Green Bay	220	--	--	--	220
Flambeau Paper Co.	Park Falls	120	120	--	--	--
Midtec Paper Corp.	Kimberly	180	--	--	180	--
Pentair, Inc.	Niagara	210	--	--	210	--
Mosinee Paper Mills Co.	Mosinee	220	--	220	--	--
Nekoosa Papers, Inc.	Nekoosa	335	--	335	--	--
Nekoosa Papers, Inc.	Port Edwards	235	235	--	--	--
Nekoosa Packaging Corp.	Tomahawk	1,000	--	--	--	1,000
Globe Industries	Cornell	100	--	--	100	--
Superior Fiber Products Co.	Superior	140	--	--	140	--
Thilmany Pulp and Paper Co.	Kaukauna	400	--	400	--	--
Wausau Paper Mills Co.	Brokaw	210	210	--	--	--
Superwood Corp.	Phillips	100	--	--	100	--
Total	19 mills	5,655	1,045	1,635	1,755	1,220
All States	35 mills	12,010	1,045	4,155	4,115	2,695

^{1/}Lockwood's Directory of the Paper and Allied Industries -- 1988.

Table 5.--Production and imports of pulpwood, Central States, 1987

(In standard cords, unpeeled)^{1/}

Species and destination	Production by States ^{2/}					Imports			Total receipts
	Illinois	Indiana	Iowa	Missouri	Regional total	Lake States	Other U.S.	Total imports	
Softwoods									
Exported ^{3/}	11,392	--	--	--	11,392	--	--	--	--
Total	11,392	--	--	--	11,392	--	--	--	--
Soft hardwoods ^{4/}									
Central States ^{5/}	6,148	13,421	10,984	12,842	43,395	--	--	--	43,395
Exported ^{3/}	10,766	--	--	9,566	20,332	--	--	--	--
Total	16,914	13,421	10,984	22,408	63,727	--	--	--	43,395
Hard hardwoods ^{6/}									
Central States ^{5/}	5,360	13,183	2,800	2,373	23,716	--	--	--	23,716
Exported ^{3/}	20,132	11,965	--	3,712	35,809	--	--	--	--
Total	25,492	25,148	2,800	6,085	59,525	--	--	--	23,716
Total roundwood									
Central States ^{5/}	11,508	26,604	13,784	15,215	67,111	--	--	--	67,111
Exported ^{3/}	42,290	11,965	--	13,278	67,533	--	--	--	--
Total	53,798	38,569	13,784	28,493	134,644	--	--	--	67,111
Residue, softwoods									
Exported ^{3/}	1,284	--	--	3,755	5,039	--	--	--	--
Total	1,284	--	--	3,755	5,039	--	--	--	--
Residue, hardwoods									
Central States ^{5/}	23,737	48,984	8,773	14,313	95,807	1,747	522	2,269	98,076
Exported ^{3/}	12,520	90,070	--	64,648	167,238	--	--	--	--
Total	36,257	139,054	8,773	78,961	263,045	1,747	522	2,269	98,076
All wood material									
Central States ^{5/}	35,245	75,588	22,557	29,528	162,918	1,747	522	2,269	165,187
Exported ^{3/}	56,094	102,035	--	81,681	239,810	--	--	--	--
Total	91,339	177,623	22,557	111,209	402,728	1,747	522	2,269	165,187

^{1/} Factors used in converting to standard green cords (128 cu.ft. including bark and air space) were:

- 4,266 pounds of softwood roundwood;
- 4,795 pounds of soft hardwood roundwood;
- 5,394 pounds of hard hardwood roundwood;
- 4,100 pounds of softwood chips (green mill residue);
- 4,400 pounds of hardwood chips (green mill residue);
- 2,500 pounds of chips (all species, dry mill residue).

^{2/} Vertical columns of figures under box heading "Production by States" present the amount of pulpwood cut in each State.^{3/} Pulpwood shipped to mills outside the region.^{4/} Hardwood species with an average specific gravity of 0.50 or less.^{5/} Combined to prevent disclosure of individual mill receipts.^{6/} Hardwood species with an average specific gravity greater than 0.50.

Table 6.--Average daily production of active woodpulp mills in the Central States by mill, location, and type of pulp produced, 1987

(In tons per 24 hours)^{1/}

		Type of pulp				
Company	Location	All types	Sulfite	Kraft	Groundwood and other mechanical	Semi-chemical
Illinois (No current operations)						
Total	0 mills	--	--	--	--	--
Indiana						
Weston Paper and Mfg. Co.	Terre Haute	270	--	--	--	270
Total	1 mill	270	--	--	--	270
Iowa						
Consolidated Packaging Corp.	Fort Madison	140	--	--	--	140
Total	1 mill	140	--	--	--	140
Missouri						
Huebert Fibreboard, Inc.	Booneville	60	--	--	60	--
Total	1 mill	60	--	--	60	--
All states	3 mills	470	--	--	60	410

^{1/}Lockwood's Directory of the Paper and Allied Industries -- 1988.

Table 7.--Lake States pulpwood production by State of origin and destination, 1983-1987

(In thousand standard cords, unpeeled)

MICHIGAN					
Year	Total cut	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1983	2,157	--	391	1,747	19
1984	2,398	--	442	1,934	22
1985	2,376	--	392	1,972	12
1986	2,808	--	369	2,429	10
1987	2,747	--	313	2,420	14
5-year average	2,497	--	381	2,101	15

MINNESOTA					
Year	Total cut	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1983	1,910	1,720	155	--	35
1984	2,150	1,888	184	--	78
1985	1,880	1,714	105	--	61
1986	1,979	1,872	69	1/	38
1987	2,079	1,967	61	--	51
5-year average	2,000	1,832	115	1/	53

WISCONSIN					
Year	Total cut	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1983	2,475	53	2,399	23	--
1984	2,644	65	2,534	45	--
1985	2,588	59	2,465	64	1/
1986	2,926	56	2,693	177	--
1987	2,869	62	2,644	161	2
5-year average	2,700	59	2,547	94	1/

1/ Less than 500 cords.

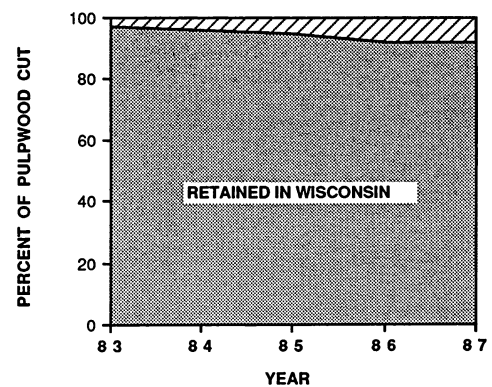
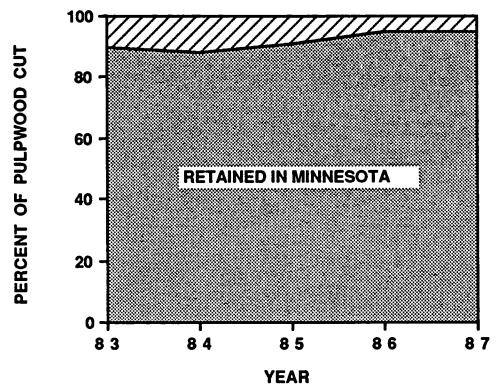
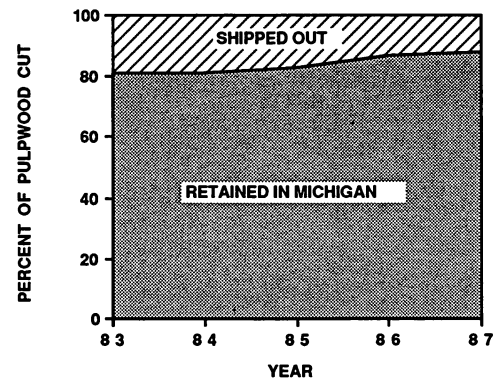


Table 8.--Lake States pulpwood production by Forest Survey Unit and destination by State, 1987

(In thousand standard cords, unpeeled)

MICHIGAN					
Unit	Total cut	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other
Roundwood					
E. Upper Peninsula	711	612	--	88	11
W. Upper Peninsula	777	580	--	196	1
N. Lower Peninsula	978	974	--	2	2
S. Lower Peninsula	52	52	--	^{1/}	--
Total	2,518	2,218	--	286	14
Residue	229	202	--	27	--
Total pulpwood	2,747	2,420	--	313	14
MINNESOTA					
Roundwood					
Aspen-Birch	969	--	894	37	38
Northern Pine	911	--	901	10	--
Central Hardwood	83	--	70	13	--
Prairie	1	--	1	--	--
Total	1,964	--	1,866	60	38
Residue	114	--	101	1	12
Total pulpwood	2,078	--	1,967	61	50
WISCONSIN					
Roundwood					
Northeastern	1,044	138	--	906	--
Northwestern	976	11	54	911	--
Central	514	^{1/}	--	514	--
Southwestern	26	--	--	26	--
Southeastern	12	--	--	12	--
Total	2,572	149	54	2,369	--
Residue	297	12	8	275	2
Total pulpwood	2,869	161	62	2,644	2

^{1/} Less than 500 cords.

Table 9.--Lake States annual pulpwood production from roundwood by species, State, and Forest Survey Unit, 1983-1987
(In thousand standard cords, unpeeled)

Unit	All species ^{1/}										Spruce				
											Pine				
	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
MICHIGAN															
Eastern Upper Peninsula	500	510	568	681	711	95	113	101	107	95	45	43	44	50	54
Western Upper Peninsula	619	635	631	866	777	52	73	67	66	58	31	33	40	40	41
Northern Lower Peninsula	802	1,004	953	1,013	978	102	105	146	142	139	1	1	(2/)	3	2
Southern Lower Peninsula	63	59	61	55	52	8	2	(2/)	(2/)	(2/)	--	--	--	--	--
Total	1,984	2,208	2,213	2,615	2,518	257	293	314	315	292	77	77	84	93	97
MINNESOTA															
Aspen-Birch	803	940	782	828	969	68	100	71	74	64	66	90	83	74	82
Northern Pine	942	1,054	951	965	911	67	85	64	60	45	29	27	28	24	19
Central Hardwood	70	63	57	82	83	5	4	3	5	2	(2/)	(2/)	(2/)	(2/)	(2/)
Prairie	1	1	(2/)	1	1	--	(2/)	(2/)	--	--	--	--	--	--	--
Total	1,816	2,058	1,790	1,876	1,964	140	189	138	139	111	95	117	111	98	101
WISCONSIN															
Northeastern	951	963	912	1,102	1,044	114	111	109	137	139	21	33	26	21	24
Northwestern	925	962	954	1,017	977	125	150	123	105	80	7	8	10	9	11
Central	300	377	385	484	513	137	182	182	233	239	(2/)	1	1	1	1
Southwestern	26	28	29	17	26	25	27	27	16	23	(2/)	(2/)	(2/)	(2/)	(2/)
Southeastern	14	18	15	15	12	11	13	10	9	7	(2/)	--	(2/)	(2/)	(2/)
Total	2,216	2,348	2,295	2,635	2,572	412	483	451	500	488	28	42	37	31	36
Total Lake States	6,016	6,614	6,298	7,126	7,054	809	965	903	954	891	200	236	232	222	234

^{1/}Includes a small quantity of cedar not shown elsewhere in the table.
^{2/}Less than 500 cords.

(Table 9 continued on next page)

(Table 9 continued)

Unit	MICHIGAN									
	Balsam fir					Hemlock				
	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
Eastern Upper Peninsula	59	44	49	49	57	27	25	19	24	20
Western Upper Peninsula	36	31	42	44	38	21	22	18	19	19
Northern Lower Peninsula	6	3	2	4	3	--	--	--	(2/)	--
Southern Lower Peninsula	--	--	--	--	--	--	--	--	(2/)	--
Total	101	78	93	97	98	48	47	37	43	39
MINNESOTA										
Aspen-Birch	51	88	69	51	61	--	--	--	--	12
Northern Pine	39	58	53	50	50	--	--	--	--	14
Central Hardwood	--	--	(2/)	--	1	--	--	--	--	(2/)
Prairie	--	--	--	--	--	--	--	--	--	(2/)
Total	90	146	122	101	112	--	--	--	--	26
WISCONSIN										
Northeastern	61	60	59	36	32	29	21	32	31	40
Northwestern	22	20	12	9	12	9	3	3	5	1
Central	2	1	--	1	1	2	1	1	1	1
Southwestern	--	--	1	--	(2/)	--	--	(2/)	--	--
Southeastern	--	--	--	(2/)	--	--	--	(2/)	--	--
Total	85	81	72	46	45	40	25	36	37	42
Total Lake States	276	305	287	244	255	88	72	73	80	81
(Table 9 continued on next page)										

2/ Less than 500 cords.

(Table 9 continued)

MICHIGAN

Unit	Aspen					Birch					Other hardwoods				
	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
Eastern Upper Peninsula	109	117	144	113	114	40	40	41	78	87	106	114	134	225	251
Western Upper Peninsula	242	212	244	252	180	64	54	48	112	106	161	200	154	313	300
Northern Lower Peninsula	523	620	576	599	593	26	26	20	30	35	144	251	209	235	206
Southern Lower Peninsula	15	13	13	15	10	(2/)	(2/)	(2/)	(2/)	(2/)	40	43	48	40	42
Total	889	962	977	979	897	130	120	109	220	228	451	608	545	813	799

MINNESOTA

Aspen-Birch	563	619	524	575	716	3	2	1	10	12	40	35	27	31	29
Northern Pine	766	853	787	820	784	1	1	1	(2/)	1	26	24	18	11	9
Central Hardwood	62	56	50	73	77	(2/)	(2/)	(2/)	(2/)	(2/)	3	3	3	4	3
Prairie	1	1	--	1	1	--	--	--	--	--	--	--	--	--	--
Total	1,392	1,529	1,361	1,469	1,578	4	3	2	10	13	69	62	48	46	41

WISCONSIN

Northeastern	451	435	396	474	369	83	90	82	144	145	190	209	205	258	294
Northwestern	481	522	556	567	572	103	105	98	126	122	175	154	153	195	178
Central	91	107	117	162	153	12	13	13	13	19	56	73	71	73	99
Southwestern	(2/)	(2/)	1	1	2	(2/)	(2/)	(2/)	(2/)	(2/)	(2/)	1	1	(2/)	1
Southeastern	2	2	3	4	1	(2/)	(2/)	(2/)	(2/)	1	1	2	1	2	3
Total	1,025	1,066	1,073	1,208	1,097	198	208	193	283	287	422	439	431	528	575
Total Lake States	3,306	3,557	3,411	3,656	3,572	332	331	304	513	528	942	1,109	1,024	1,387	1,415

2/ Less than 500 cords.

Table 10.--Michigan pulpwood production from roundwood by county and species group, 1987
(In standard cords, unpeeled)

Unit and county ^{1/}	Species group											
	All species	Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
E. Upper Peninsula												
Alger	97,546	2,518	3,940	4,922	6,766	724	1,307	3,192	170	1,033	5,244	1,880
Chippewa	62,028	2,683	5,382	1,412	14,869	690	1,318	4,791	227	103	10,645	940
Delta	215,098	11,435	18,569	5,458	21,179	3,460	5,753	18,845	862	1,479	34,919	7,674
Luce	39,457	1,130	3,473	1,458	9,489	199	479	4,073	128	58	3,134	456
Mackinac	53,707	1,554	4,729	1,267	3,408	497	769	5,289	143	211	10,425	1,551
Menominee	153,263	4,380	12,624	2,977	4,706	991	1,932	9,992	484	1,115	42,429	4,496
Schoolcraft	89,709	6,362	8,384	2,532	11,561	1,902	3,336	7,743	415	432	7,188	3,242
Total	710,808	30,062	57,101	20,026	71,978	8,463	14,894	53,925	2,429	4,431	113,984	20,239
W. Upper Peninsula												
Baraga	69,932	1,211	920	1,946	2,698	426	680	1,069	57	1,533	4,414	--
Dickinson	118,111	5,147	15,517	4,130	2,775	1,941	2,118	13,180	18,251	381	29,579	--
Gogebic	74,974	16	541	2,568	2,012	916	267	2,732	15	1,176	13,598	--
Houghton	53,374	2,033	4,414	1,199	7,335	761	1,125	3,491	181	944	3,006	--
Iron	116,531	1,184	3,811	1,164	2,559	1,860	927	8,863	331	1,550	36,141	354
Keweenaw	2,862	--	19	3	197	94	111	9	--	98	--	--
Marquette	215,949	6,257	12,565	7,108	22,441	1,614	3,059	11,886	619	1,819	30,910	4,688
Ontonagon	125,035	24	479	580	815	457	828	168	5	3,459	62,241	--
Total	776,768	15,872	38,266	18,698	40,832	8,069	9,115	41,398	19,459	10,960	179,889	5,042
N. Lower Peninsula												
Alcona	58,012	--	--	--	3,743	574	--	--	--	522	41,294	1,593
Alpena	22,191	--	246	--	341	61	--	128	--	302	15,829	396
Antrim	2,471	--	--	--	29	--	--	--	--	--	2,406	--
Arenac	3,612	--	--	--	--	12	--	--	--	--	1,194	49
Bay	71	--	--	--	20	--	--	--	--	--	51	--
Benzie	20,248	--	--	--	255	--	--	--	--	17	15,389	--
Charlevoix	3,305	--	--	--	106	--	--	--	--	28	2,376	--
Cheboygan	48,254	--	579	--	2,301	225	--	700	--	541	31,948	307
Clare	23,421	--	--	--	220	411	--	--	--	91	19,581	--
Crawford	83,585	--	30	--	39,813	790	--	--	--	18	32,092	63
Emmet	17,029	--	269	--	214	424	--	380	--	--	12,000	--
Gladwin	14,153	--	--	--	427	42	--	--	--	202	11,507	--
Grand Traverse	9,954	--	--	--	3,965	910	--	--	--	5	4,281	--
Iosco	10,498	--	20	--	1,101	242	--	--	--	346	5,860	121
Isabella	12,389	--	--	--	--	--	--	--	--	58	11,942	--
Kalkaska	27,962	--	--	--	8,279	1,664	--	--	--	113	13,656	--
Lake	62,154	--	--	--	2,778	870	--	--	--	312	35,671	--
Leelanau	4,208	--	--	--	--	170	--	--	--	--	2,144	--
Manistee	36,507	--	--	--	--	387	--	--	--	298	9890	--
Mason	39,591	--	--	--	43	312	--	--	--	241	28,956	--
Mecosta	44,542	--	--	--	46	117	--	--	--	913	36,428	--
Midland	15,027	--	--	--	--	--	--	--	--	148	13,624	--
Missaukee	37,320	--	--	--	2,314	2,318	--	--	--	144	25,678	--
Montmorency	56,333	--	183	--	8,664	92	--	118	--	350	36,398	488
Newaygo	40,846	--	--	--	278	1,467	--	--	--	256	24,126	--
Oceana	19,653	--	--	--	--	--	--	--	--	305	10,101	--
Ogemaw	11,566	--	--	--	724	19	--	--	--	69	8,123	53
Osceola	46,844	--	--	--	25	894	--	--	--	443	39,147	--
Oscoda	55,726	--	133	--	23,014	634	--	6	--	438	21,902	452
Otsego	37,048	--	--	--	8,843	2,107	--	--	--	1	16,801	--
Presque Isle	41,291	--	1,207	--	2,433	98	--	396	--	540	25,482	770
Roscommon	31,309	--	--	--	10,722	495	--	--	--	40	17,295	25
Wexford	40,565	--	--	--	335	2,673	--	--	--	431	19,708	--
Total	977,685	--	2,667	--	121,033	18,008	--	1,728	--	7,172	592,880	4,317
S. Lower Peninsula												
Allegan	6,705	--	--	--	--	--	--	--	--	370	686	--
Barry	1,344	--	--	--	--	--	--	--	--	69	221	--
Berrien	657	--	--	--	--	--	--	--	--	--	55	--
Calhoun	2,017	--	--	--	--	--	--	--	--	--	233	--
Cass	78	--	--	--	--	--	--	--	--	--	--	--
Gratiot	120	--	--	--	--	--	--	--	--	--	109	--
Huron	775	--	--	--	--	--	--	--	--	--	775	--
Ingham	98	--	--	--	--	--	--	--	--	--	98	--
Ionia	484	--	--	--	--	--	--	--	--	--	244	--
Kalamazoo	3,028	--	--	--	--	--	--	--	--	171	233	--
Kent	1,607	--	--	--	--	65	--	--	--	66	178	--
Montcalm	6,136	--	--	--	--	--	--	--	--	173	3,077	--
Muskegon	20,086	--	--	--	--	--	--	--	--	309	1,931	--
Ottawa	4,534	--	--	--	--	--	--	--	--	221	1,343	--
St. Joseph	1,489	--	--	--	--	--	--	--	--	--	--	--
Sanilac	624	--	--	--	--	--	--	--	--	--	624	--
Van Buren	2,715	--	--	--	--	--	--	--	--	157	155	--
Total	52,497	--	--	--	--	65	--	--	--	1,536	9,962	--
State total	2,517,758	45,934	98,034	38,724	233,843	34,605	24,009	97,051	21,888	24,099	896,715	29,598

^{1/}Includes only those counties that supplied pulpwood in 1987.

(Table 10 continued on next page)

(Table 10 continued)

Unit and county ^{1/}	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton- wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
E. Upper Peninsula												
Alger	2,394	10,499	4,740	5,519	--	1,293	--	28,381	10,725	510	--	1,789
Chippewa	695	4,701	1,396	1,163	--	465	--	7,252	3,093	89	--	114
Delta	6,174	6,045	19,078	9,484	--	4,216	--	20,923	16,704	1,179	--	1,662
Luce	335	4,551	1,087	639	--	234	--	6,202	2,192	69	--	71
Mackinac	1,243	3,429	3,351	1,815	--	807	--	8,603	4,088	270	--	258
Menominee	3,699	3,695	23,037	6,062	--	2,497	--	14,482	10,987	1,357	3	1,318
Schoolcraft	2,318	4,693	6,165	3,639	--	1,683	--	10,288	7,005	296	--	525
Total	16,858	37,613	58,854	28,321	--	11,195	--	96,131	54,794	3,770	3	5,737
W. Upper Peninsula												
Baraga	1,983	1,249	5,926	5,665	--	684	--	24,556	10,648	1,545	--	2,722
Dickinson	892	--	11,485	1,626	--	357	--	6,288	3,157	817	--	470
Gogebic	3,651	92	3,875	5,488	--	950	--	21,518	10,889	2,876	--	1,794
Houghton	1,200	546	3,569	2,836	--	448	--	11,982	5,912	1,136	--	1,256
Iron	2,326	625	14,683	4,951	--	751	--	20,570	9,834	2,106	--	1,941
Keweenaw	--	143	14	262	--	--	--	1,217	433	71	--	191
Marquette	6,568	3,874	27,604	11,118	--	3,490	--	29,801	20,652	7,033	--	2,843
Ontonagon	6,346	131	2,715	3,606	--	1,076	--	26,293	11,815	2,363	3	1,631
Total	22,966	6,660	69,871	35,552	--	7,756	--	142,225	73,340	17,947	3	12,848
N. Lower Peninsula												
Alcona	116	195	4,838	1	--	--	--	259	2,668	1,999	210	--
Alpena	64	49	1,566	--	--	--	--	157	2,777	248	27	--
Antrim	--	--	36	--	--	--	--	--	--	--	--	--
Arenac	32	--	--	--	--	--	--	47	2,278	--	--	--
Bay	--	--	--	--	--	--	--	--	--	--	--	--
Benzie	312	336	784	7	--	--	--	877	1,218	732	209	112
Charlevoix	195	19	213	13	--	--	--	116	233	6	--	--
Cheboygan	503	1,119	2,343	--	--	--	--	1,297	6,356	35	--	--
Clare	--	49	533	--	--	--	--	36	1,028	1,064	408	--
Crawford	39	397	653	--	--	--	--	542	1,206	7,384	558	--
Emmet	110	1173	--	--	--	--	--	626	1,693	140	--	--
Gladwin	--	--	635	5	--	--	--	--	711	473	151	--
Grand Traverse	52	57	167	4	--	--	--	117	128	92	82	94
Iosco	21	86	780	--	--	--	--	86	1,382	438	15	--
Isabella	--	5	39	--	--	--	--	7	158	118	62	--
Kalkaska	85	65	631	72	--	--	--	978	1,711	570	138	--
Lake	195	215	1,826	19	--	--	--	556	5,881	9,397	4,267	167
Leelanau	208	208	162	76	--	--	--	208	625	208	147	52
Manistee	416	681	699	163	--	--	--	1,488	5,605	14,159	2,384	337
Mason	208	236	1,808	28	--	--	--	465	1,969	4,096	1,021	208
Mecosta	--	18	1,285	80	--	--	--	796	2,520	1,350	989	--
Midland	52	80	474	4	--	--	--	2	420	122	101	--
Missaukee	208	175	725	1	--	--	--	372	1,622	2,788	819	156
Montmorency	182	372	2,379	--	--	--	--	536	3,362	3,030	179	--
Newaygo	--	109	456	48	--	--	--	244	3,192	7,100	3,490	80
Oceana	--	122	105	72	--	--	--	268	1,815	3,997	2,868	--
Ogemaw	13	19	823	2	--	--	--	38	378	1,195	110	--
Osceola	--	226	1,080	109	--	--	--	1,140	2,284	1,410	86	--
Oscoda	116	241	2,250	1	--	--	--	256	3,065	3,071	147	--
Otsego	565	1,158	42	--	--	--	--	1,854	5,111	566	--	--
Presque Isle	261	336	4,467	--	--	--	--	436	4,643	213	9	--
Roscommon	--	2	576	3	--	--	--	7	155	1,771	218	--
Wexford	416	582	1,551	206	--	--	--	1,588	6,955	4,653	998	469
Total	4,369	8,330	33,926	914	--	--	--	15,399	73,149	72,425	19,693	1,675
S. Lower Peninsula												
Allegan	--	337	--	--	--	340	313	306	697	1,758	1,898	--
Barry	--	61	--	--	--	60	56	64	134	336	343	--
Berrien	--	40	--	--	--	40	37	36	72	181	196	--
Calhoun	--	--	--	--	--	--	--	--	223	750	811	--
Cass	--	--	--	--	--	--	--	--	--	34	44	--
Gratiot	--	--	--	--	--	--	--	--	5	6	--	--
Huron	--	--	--	--	--	--	--	--	--	--	--	--
Ingham	--	--	--	--	--	--	--	--	--	--	--	--
Ionia	--	--	--	--	--	40	37	--	74	28	61	--
Kalamazoo	--	156	--	--	--	159	146	143	322	816	882	--
Kent	--	38	--	2	--	40	37	83	292	489	317	--
Montcalm	--	33	46	--	--	--	--	25	590	1,127	1,065	--
Muskegon	--	278	31	23	--	--	--	57	3,239	8,287	5,931	--
Ottawa	--	261	--	21	--	113	104	172	651	877	771	--
St. Joseph	--	--	--	--	--	--	--	--	169	857	463	--
Sanilac	--	--	--	--	--	--	--	--	--	--	--	--
Van Buren	--	143	--	--	--	145	134	131	295	747	808	--
Total	--	1,347	77	46	--	937	864	1,017	6,763	16,293	13,590	--
State total	44,193	53,950	162,728	64,833	--	19,888	864	254,772	208,046	110,435	33,289	20,260

^{1/}Includes only those counties that supplied pulpwood in 1987.

Table 11.-- Minnesota pulpwood production from roundwood by county and species group, 1987

(In standard cords, unpeeled)

Unit and county ^{1/}	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
Aspen-Birch												
Carlton	39,860	--	8,840	--	1,223	1,088	47	1,937	55	--	23,087	2,005
Cook	47,231	--	8,260	--	5,383	547	530	13,611	--	--	18,900	--
Koochiching	181,853	--	11,409	--	10,933	3,074	182	24,354	3,974	--	122,863	4,165
Lake	114,727	--	4,820	--	3,501	1,038	269	11,892	--	--	79,698	5,792
St. Louis	585,517	--	27,075	--	25,908	8,900	1,277	29,752	1,377	--	471,850	17,294
Total	969,188	--	60,404	--	46,948	14,647	2,305	81,546	5,406	--	716,398	29,256
Northern Pine												
Aitkin	66,118	--	572	--	122	76	6	380	--	--	59,308	5,507
Becker	41,089	--	--	--	285	99	12	--	--	--	40,502	191
Beltrami	152,080	--	15,007	--	4,176	1,354	121	3,242	103	--	127,695	382
Cass	116,944	--	4,989	--	3,836	1,161	217	1,379	--	--	104,875	487
Clearwater	83,543	--	899	--	1,031	379	41	566	--	--	80,436	191
Crow Wing	40,139	--	--	--	3,256	622	158	60	--	--	35,856	187
Hubbard	86,179	--	--	--	2,838	971	117	148	--	--	81,819	286
Itasca	285,336	--	28,879	--	6,677	3,198	231	13,065	1,928	--	229,470	1,734
Lake of the Woods	12,361	--	--	--	7,661	526	--	639	827	--	2,708	--
Mahnomen	17,086	--	--	--	--	--	--	--	--	--	16,990	96
Roseau	4,987	--	--	--	4,658	--	--	104	225	--	--	--
Wadena	5,355	--	--	--	613	171	39	--	--	--	4,513	19
Total	911,217	--	50,346	--	35,153	8,557	942	19,583	3,083	--	784,172	9,080
Central Hardwood												
Kanabec	732	--	--	--	--	--	--	--	--	--	732	--
Mille Lacs	32,757	--	--	--	52	14	3	14	--	--	32,643	31
Morrison	4,387	--	--	--	52	14	3	--	--	--	4,312	6
Pine	42,955	--	1,730	--	211	187	8	--	--	--	38,142	2,607
Sherburne	1,596	--	--	--	579	1,017	--	--	--	--	--	--
Todd	725	--	--	--	52	14	3	--	--	--	650	6
Total	83,152	--	1,730	--	946	1,246	17	14	--	--	76,479	2,650
Prairie												
Polk	620	--	--	--	--	--	--	--	--	--	620	--
Red Lake	417	--	--	--	--	--	--	--	--	--	417	--
Total	1,037	--	--	--	--	--	--	--	--	--	1,037	--
State total	1,964,594	--	112,480	--	83,047	24,450	3,264	101,143	8,489	--	1,578,086	40,986

(Table 11 continued on next page)

^{1/} Includes only those counties that supplied pulpwood in 1987.

(Table 11 continued)

Unit and county ^{1/}	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton- wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Aspen-Birch												
Carlton	--	--	1,578	--	--	--	--	--	--	--	--	--
Cook	--	--		--	--	--	--	--	--	--	--	--
Koochiching	--	--	899	--	--	--	--	--	--	--	--	--
Lake	--	--	7,717	--	--	--	--	--	--	--	--	--
St. Louis	--	--	2,084	--	--	--	--	--	--	--	--	--
Total	--	--	12,278	--	--	--	--	--	--	--	--	--
Northern Pine												
Aitkin	--	--	147	--	--	--	--	--	--	--	--	--
Becker	--	--	--	--	--	--	--	--	--	--	--	--
Beltrami	--	--	--	--	--	--	--	--	--	--	--	--
Cass	--	--	--	--	--	--	--	--	--	--	--	--
Clearwater	--	--	--	--	--	--	--	--	--	--	--	--
Crow Wing	--	--	--	--	--	--	--	--	--	--	--	--
Hubbard	--	--	--	--	--	--	--	--	--	--	--	--
Itasca	--	--	154	--	--	--	--	--	--	--	--	--
Lake of the Woods	--	--	--	--	--	--	--	--	--	--	--	--
Mahnomen	--	--	--	--	--	--	--	--	--	--	--	--
Roseau	--	--	--	--	--	--	--	--	--	--	--	--
Wadena	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	301	--	--	--	--	--	--	--	--	--
Central Hardwood												
Kanabec	--	--	--	--	--	--	--	--	--	--	--	--
Mille Lacs	--	--	--	--	--	--	--	--	--	--	--	--
Morrison	--	--	--	--	--	--	--	--	--	--	--	--
Pine	--	--	70	--	--	--	--	--	--	--	--	--
Sherburne	--	--	--	--	--	--	--	--	--	--	--	--
Todd	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	70	--	--	--	--	--	--	--	--	--
Prairie												
Polk	--	--	--	--	--	--	--	--	--	--	--	--
Red Lake	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
State total	--	--	12,649	--	--	--	--	--	--	--	--	--

^{1/}Includes only those counties that supplied pulpwood in 1987.

Table 12.--Wisconsin pulpwood production from roundwood by county and species group, 1987
(In standard cords, unpeeled)

Unit and county ^{1/}	All species	Species group										Balsam poplar
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	
Northeastern												
Florence	95,225	--	5,592	763	8,619	2,596	217	5,068	88	1,309	32,021	--
Forest	151,093	--	6,796	2,585	1,599	7,518	185	6,046	62	6,201	35,391	--
Langlade	94,554	--	1,800	394	2,050	4,642	182	594	11	4,330	31,992	--
Lincoln	149,416	--	3,466	16,534	5,530	5,071	773	1,313	44	5,169	65,900	--
Marinette	158,284	--	5,575	409	21,434	4,849	205	3,305	295	2,449	63,275	104
Menominee	54,670	--	60	17,053	5,368	2,836	232	13	--	1,263	9,018	--
Oconto	63,653	--	812	129	7,162	7,931	56	128	56	539	24,635	--
Oneida	127,542	--	5,230	1,485	10,469	12,636	2,642	4,804	173	3,222	40,535	--
Shawano	30,807	--	159	1,152	1,077	6,056	336	--	--	520	8,262	--
Vilas	118,591	--	2,238	38	10,749	4,131	1,518	2,295	36	1,417	58,499	--
Total	1,043,835	--	31,728	40,542	74,057	58,266	6,346	23,566	765	26,419	369,528	104
Northwestern												
Ashland	86,392	--	3,240	178	1,169	2,923	217	6,161	90	3,303	37,666	--
Barron	23,436	--	11	--	87	503	--	--	--	285	18,860	--
Bayfield	181,949	--	695	1	13,850	6,876	616	17	--	1,812	116,243	1,604
Burnett	52,153	--	153	--	11,925	1,891	12	65	--	66	36,003	--
Douglas	107,650	--	2,138	--	15,109	5,222	51	440	--	801	70,633	601
Iron	49,020	--	382	88	141	473	54	318	14	682	27,631	--
Polk	15,242	--	12	--	11	11	--	--	--	24	14,941	--
Price	102,682	--	2,506	50	1,372	2,898	93	1,566	98	7,388	40,694	--
Rusk	50,621	--	13	24	--	841	--	56	50	2,707	29,930	--
Sawyer	154,712	--	1,061	708	1,223	1,579	164	1,942	155	6,752	86,009	--
Taylor	65,578	--	1,749	70	219	2,102	--	643	68	3,466	28,103	--
Washburn	86,948	--	110	--	7,107	1,688	134	10	111	1,523	64,808	--
Total	976,383	--	12,070	1,119	52,213	27,007	1,341	11,218	586	28,809	571,521	2,205
Central												
Adams	53,396	--	--	--	20,365	22,897	3,303	--	--	34	1,212	--
Chippewa	27,980	--	--	51	750	1,288	28	145	91	1,211	14,769	--
Clark	59,600	--	147	27	3,282	3,303	90	68	25	2,720	26,708	--
Eau Claire	23,577	--	36	--	6,325	7,377	348	--	--	33	7,915	--
Jackson	54,328	--	49	21	23,530	7,510	476	26	21	63	11,601	--
Juneau	36,194	--	--	--	16,159	11,608	1,335	52	--	163	320	--
Marathon	89,996	--	444	304	3,388	9,526	361	333	10	1,675	48,485	--
Marquette	17,495	--	--	--	2,083	10,415	899	10	22	54	262	--
Monroe	16,898	--	11	--	9,023	5,146	360	--	--	45	754	--
Portage	31,767	--	71	95	7,166	10,282	1,496	362	32	449	6,079	--
Waupaca	20,393	--	11	102	259	8,013	1,043	13	50	199	7,956	--
Waushara	25,275	--	--	10	2,465	18,837	1,796	12	26	24	1,256	--
Wood	56,568	--	34	5	6,553	8,249	1,615	111	--	1,111	26,485	--
Total	513,467	--	803	615	101,348	124,451	13,150	1,132	277	7,781	153,802	--
Southwestern												
Buffalo	1,510	--	--	--	24	1,274	212	--	--	--	--	--
Crawford	45	--	--	--	--	45	--	--	--	--	--	--
Dunn	11,543	--	77	--	1,781	7,027	254	--	--	14	1,175	--
Iowa	353	--	--	--	--	353	--	--	--	--	--	--
La Crosse	3,645	--	--	--	1,022	2,304	272	47	--	--	--	--
Lafayette	21	--	--	--	--	--	--	--	--	--	--	--
Pepin	303	--	--	--	11	229	25	--	--	--	38	--
Pierce	83	--	--	--	--	26	12	--	--	--	45	--
Richland	11	--	--	--	--	11	--	--	--	--	--	--
St. Croix	375	--	--	--	15	51	--	--	--	--	309	--
Sauk	3,683	--	--	--	124	2,849	710	--	--	--	--	--
Trempealeau	4,614	--	--	--	140	3,802	484	95	--	--	--	--
Total	26,186	--	77	--	3,117	17,971	1,969	142	--	14	1,567	--
Southeastern												
Brown	347	--	--	--	--	85	--	--	--	--	262	--
Columbia	6,706	--	--	--	183	4,028	366	--	--	107	23	--
Door	12	--	--	--	--	12	--	--	--	--	--	--
Fond du Lac	215	--	--	--	--	11	204	--	--	--	--	--
Green	24	--	--	--	--	--	13	--	--	--	--	--
Green Lake	270	--	--	--	--	195	62	--	--	--	--	--
Jefferson	818	--	--	--	14	485	305	14	--	--	--	--
Kewaunee	228	--	--	--	--	218	10	--	--	--	--	--
Manitowoc	1,042	--	--	--	--	--	58	7	--	49	--	--
Outagamie	1,378	--	--	--	--	365	--	34	--	13	702	--
Ozaukee	51	--	--	--	--	51	--	--	--	--	--	--
Sheboygan	204	--	--	--	--	105	10	--	--	4	--	--
Walworth	340	--	--	--	13	327	--	--	--	--	--	--
Washington	10	--	--	--	--	--	10	--	--	--	--	--
Waukesha	310	--	--	--	10	276	24	--	--	--	--	--
Total	11,955	--	--	--	220	6,158	1,062	55	--	173	987	--
State total	2,571,826	--	44,678	42,276	230,955	233,853	23,868	36,113	1,628	63,196	1,097,405	2,309

^{1/}Includes only those counties that supplied pulpwood in 1987.

(Table 12 continued on next page)

(Table 12 continued)

WISCONSIN

Unit and county ^{1/}	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Northeastern												
Florence	1,599	25	14,015	2,396	--	658	--	13,490	4,810	1,271	28	660
Forest	4,155	163	18,547	6,821	--	5,785	--	31,119	16,421	585	5	1,109
Langlade	1,971	196	10,524	2,455	--	509	--	21,001	9,521	1,084	4	1,294
Lincoln	1,499	--	9,953	1,071	--	2,615	--	14,246	12,573	2,690	--	969
Marinette	1,427	341	22,108	1,547	--	4,205	--	13,333	10,280	2,078	50	1,015
Menominee	118	1049	2,068	1,795	--	993	--	7,658	3,894	457	4	791
Oconto	843	121	8,242	554	--	518	--	7,026	3,608	814	11	468
Oneida	1,514	--	21,938	1,283	--	318	--	10,608	8,662	1,720	--	303
Shawano	357	353	2,098	629	--	742	--	4,419	3,698	651	25	273
Vilas	1,663	26	15,257	1,646	--	306	--	10,971	5,534	1,758	86	423
Total	15,146	2,274	124,750	20,197	--	16,649	--	133,871	79,001	13,108	213	7,305
Northwestern												
Ashland	382	--	9,453	1,189	--	385	--	11,626	7,386	579	208	237
Barron	44	--	1,847	--	--	16	--	160	223	873	495	32
Bayfield	198	--	27,597	437	--	326	--	5,351	3,774	2,500	15	37
Burnett	--	--	1,343	--	--	29	--	251	310	87	7	11
Douglas	--	--	10,946	107	--	144	--	702	745	10	1	--
Iron	826	1	9,307	1,089	--	128	--	4,761	2,343	508	--	274
Polk	1	--	53	--	--	--	--	13	28	105	39	4
Price	1,437	3	14,287	1,571	--	1,200	--	13,375	12,480	1,304	3	357
Rusk	966	--	5,898	321	--	164	--	4,083	3,136	1,949	301	182
Sawyer	1,996	--	21,288	2,636	--	390	--	13,896	10,350	4,026	439	98
Taylor	1,252	7	6,132	985	--	2,150	--	7,332	10,733	520	--	47
Washburn	35	--	5,297	125	--	88	--	1,210	1,963	2,101	549	89
Total	7,137	11	113,448	8,460	--	5,020	--	62,760	53,471	14,562	2,057	1,368
Central												
Adams	6	--	69	--	--	2	--	52	76	4,625	752	3
Chippewa	76	--	3,403	202	--	84	--	2,196	2,186	1,127	343	30
Clark	1125	7	5,462	488	--	1290	--	5,047	6,239	2,214	1,264	94
Eau Claire	13	--	338	--	--	51	--	107	385	486	132	31
Jackson	--	--	1,484	21	--	106	--	231	3,313	4,137	1,527	212
Juneau	--	--	469	--	--	80	--	319	563	3,460	1,607	59
Marathon	850	112	2,348	1410	--	5,940	--	6,304	6,971	1,068	272	195
Marquette	--	2	417	4	--	21	--	228	365	1,564	1,146	3
Monroe	--	--	218	--	--	27	--	105	204	700	278	27
Portage	9	17	549	52	--	41	--	808	554	2,065	1,616	24
Waupaca	52	14	250	47	--	304	--	850	910	190	90	40
Waushara	--	--	79	--	--	67	--	194	204	176	128	1
Wood	1,561	7	1,536	12	--	75	--	704	2,179	3,676	2,646	9
Total	3,692	159	16,622	2,236	--	8,088	--	17,145	24,149	25,488	11,801	728
Southwestern												
Buffalo	--	--	--	--	--	--	--	--	--	--	--	--
Crawford	--	--	--	--	--	--	--	--	--	--	--	--
Dunn	--	--	301	2	--	5	--	432	338	87	47	3
Iowa	--	--	--	--	--	--	--	--	--	--	--	--
La Crosse	--	--	--	--	--	--	--	--	--	--	--	--
Lafayette	--	--	--	--	--	--	--	11	10	--	--	--
Pepin	--	--	--	--	--	--	--	--	--	--	--	--
Pierce	--	--	--	--	--	--	--	--	--	--	--	--
Richland	--	--	--	--	--	--	--	--	--	--	--	--
St. Croix	--	--	--	--	--	--	--	--	--	--	--	--
Sauk	--	--	--	--	--	--	--	--	--	--	--	--
Trempealeau	--	--	28	--	--	1	--	--	50	8	3	3
Total	--	--	329	2	--	6	--	443	398	95	50	6
Southeastern												
Brown	--	--	--	--	--	--	--	--	--	--	--	--
Columbia	--	--	266	--	--	10	--	287	181	693	562	--
Door	--	--	--	--	--	--	--	--	--	--	--	--
Fond du Lac	--	--	--	--	--	--	--	--	--	--	--	--
Green	--	--	--	--	--	--	--	6	5	--	--	--
Green Lake	--	--	--	--	--	--	--	7	6	--	--	--
Jefferson	--	--	--	--	--	--	--	--	--	--	--	--
Kewaunee	--	--	--	--	--	--	--	--	--	--	--	--
Manitowoc	--	--	98	--	--	147	--	342	341	--	--	--
Outagamie	--	2	23	4	--	34	--	100	89	6	3	3
Ozaukee	--	--	--	--	--	--	--	--	--	--	--	--
Sheboygan	--	--	8	--	--	14	--	31	32	--	--	--
Walworth	--	--	--	--	--	--	--	--	--	--	--	--
Washington	--	--	--	--	--	--	--	--	--	--	--	--
Waukesha	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	2	395	4	--	205	--	773	654	699	565	3
State total	25,975	2,446	255,544	30,899	--	29,968	--	214,992	157,673	53,952	14,686	9,410

^{1/} Includes only those counties that supplied pulpwood in 1987.

Table 13.--Central States pulpwood production by State and destination, 1983-1987

(In thousand standard cords, unpeeled)

Year	Illinois			Indiana			Iowa			Missouri		
	Total	Destination		Total	Destination		Total	Destination		Total	Destination	
		Central States	Other States		Central States	Other States		Central States	Other States		Central States	Other States
1983	91	31	60	226	62	164	16	11	5	114	39	75
1984	82	29	53	206	56	150	20	14	6	86	32	54
1985	68	25	43	224	68	156	19	13	6	91	27	64
1986	69	30	39	153	64	89	21	17	4	87	26	61
1987	91	35	56	178	76	102	23	23	--	111	29	82

Table 14.--Trends in receipts of roundwood and residue as pulpwood, Central States, 1983-1987

(In thousand standard cords, unpeeled)

Type of material and area	1983	1984	1985	1986	1987
Roundwood					
Illinois	--	--	--	--	--
Indiana, Iowa, Missouri	69	62	63	57	67
Total	69	62	63	57	67
Residue					
Illinois	--	--	--	--	--
Indiana, Iowa, Missouri	79	70	73	81	98
Total	79	70	73	81	98
All material	148	132	136	138	165