



Resource Bulletin
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Pulpwood Production in the North-Central Region, 1995

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NOTE: This report includes all primary products made from reconstituted wood fiber. In addition to wood pulp, this includes particleboard and engineered lumber products¹ made from chips, shavings, wafers, flakes, strands, and sawdust. This report presents the production by county of the raw fiber material delivered to mills. Thus, these data report only that portion of the timber harvest used as raw material and do not necessarily reflect the volume of growing stock harvested.

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) and the Plains States (Kansas, Nebraska, North Dakota, and South Dakota).

Current detailed information about pulpwood production² is necessary for intelligent planning and decision making in wood procurement, forest resource management, forest industry development, and scientific studies.

Since 1979, we have included logs, bolts, and wood residue used in manufacturing flake board, wafer board, oriented strand board, and medium density fiberboard in this annual report. Engineered lumber was included in this report in 1992. 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.

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Particleboard mills were in their infancy before 1979 and used primarily aspen and wood residue. Therefore, data for these mills does not distort roundwood use trends for other species nor preclude comparing 1995 survey results with those of 1978 and previous years.

Pulp and particleboard mills using North Central States timber in 1995 reported their pulpwood receipts³ by species group and county of origin. This report presents the results of the survey, analyzes the data, compares results with those of 1994 or earlier years, and discusses trends in pulpwood production and use.

The Lake States, Central States, and Plains States are discussed separately because the timber types in each area are different, the flow of wood between the areas is nominal, and more detailed data on pulpwood production and receipts in the Central and Plains States might reveal the operations of individual mills. This is the 37th annual report of the pulpwood harvest in Lake States counties, the 36th annual report of the Central States harvest, and the 3rd report of the pulpwood harvest in the Plains States.

Several mills purchase their pulpwood based on weight rather than volume. Conversion factors to convert green tons of pulpwood to standard cord equivalents are shown in the Appendix.

¹U.S. Forest Products Laboratory. 1974. *Wood handbook: wood as an engineering material*. Agric. Handb. 72. Washington, DC: U.S. Department of Agriculture, Forest Service: 23-27. (revised)

²Pulpwood 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, wafer board, oriented strand board, medium density fiberboard, or engineered lumber.

³Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.

LAKE STATES

PRODUCTION

- Pulpwood production as a whole decreased to 9.6 million cords⁴ in 1995 from 9.7 million cords in 1994, a fall of 2 percent (table 1). Of each cord produced, 92 percent came from roundwood (including chips from roundwood) and 8 percent came from the residue⁵ of wood-using plants (fig. 1).
- Hardwoods constituted 76 percent of the total pulpwood production.
- Principal species of roundwood harvested in 1995 were aspen (4.3 million cords), jack pine (719 thousand cords), hard maple (673 thousand cords), soft maple (555 thousand cords), and white birch (531 thousand cords).
- Aspen remained the dominant species of pulpwood roundwood harvested—49 percent.

- Softwood roundwood production decreased by 35 thousand cords, or 2 percent in 1995. Pulpwood production from softwood residue rose to 345 thousand cords, a 42-percent gain from the previous year (fig. 2).

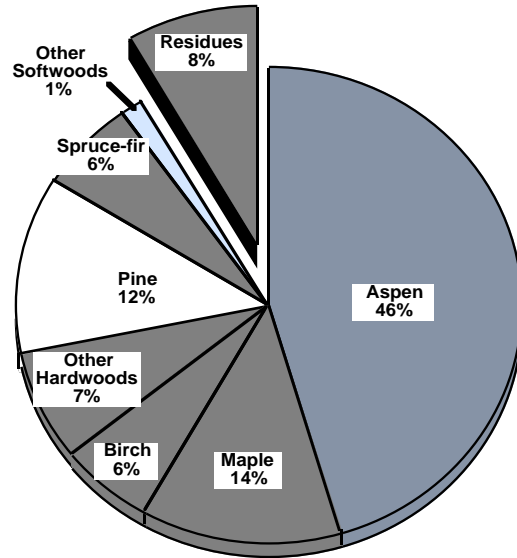


Figure 1.—Lake States pulpwood production by species group and residues, 1995.

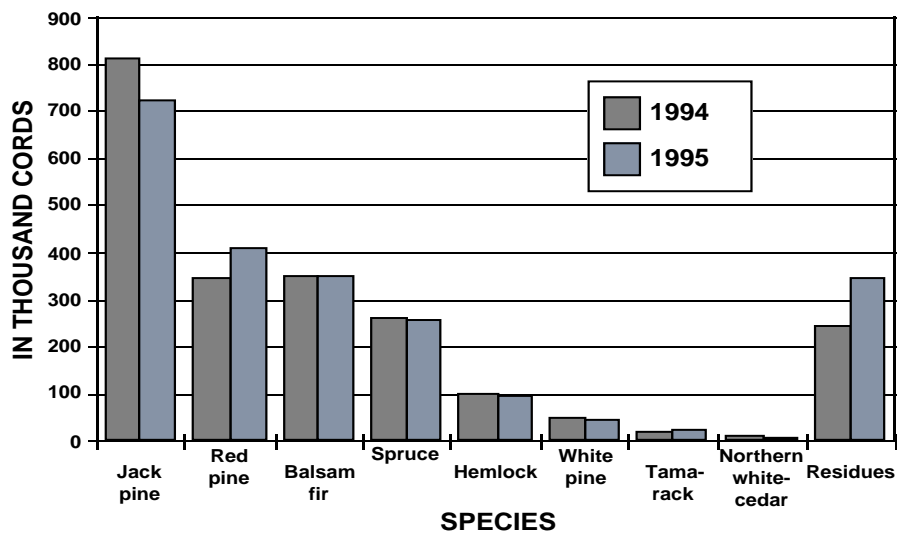


Figure 2.—Softwood pulpwood production in the Lake States, 1994-1995.

⁴All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.

⁵Residue 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, fines, woodflour, and chips manufactured from slabs, edgings, and veneer cores.

Table 1.--Production and imports of pulpwood, Lake States, 1995 1/

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State 2/			Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S. 3/	Canada		
Roundwood										
N. white-cedar										
Michigan	4,323	-	230	4,553	-	-	-	1	1	4,554
Total	4,323	-	230	4,553	-	-	-	1	1	4,554
Balsam fir										
Canada	7,492	-	-	7,492	-	-	-	-	-	-
Michigan	54,991	-	2,986	57,977	-	-	-	12	12	57,989
Minnesota	9,536	197,737	16,857	224,129	-	-	-	2,466	2,466	226,595
Wisconsin	7,353	-	53,527	60,880	-	-	-	-	-	60,880
Total	79,372	197,737	73,370	350,478	-	-	-	2,477	2,477	345,464
Hemlock										
Michigan	62,653	-	5,653	68,307	-	-	-	6	6	68,313
Wisconsin	3,006	-	22,404	25,411	-	-	-	-	-	25,411
Total	65,660	-	28,058	93,717	-	-	-	6	6	93,723
Jack pine										
Michigan	170,017	-	6,468	176,485	-	-	-	150	150	176,636
Minnesota	-	88,813	11,737	100,550	-	-	-	-	-	100,550
Wisconsin	61,394	8,314	372,059	441,766	-	-	-	-	-	441,766
Total	231,411	97,126	390,264	718,801	-	-	-	150	150	718,952
Red pine										
Michigan	90,649	-	2,855	93,504	-	-	-	148	148	93,652
Minnesota	-	22,130	8,285	30,415	-	-	-	-	-	30,415
Wisconsin	27,264	1,959	254,713	283,937	-	-	-	-	-	283,937
Total	117,913	24,089	265,854	407,856	-	-	-	148	148	408,004
White pine										
Michigan	4,375	-	214	4,589	-	-	-	1	1	4,590
Minnesota	-	619	74	692	-	-	-	-	-	692
Wisconsin	1,435	188	38,327	39,950	-	-	-	-	-	39,950
Total	5,810	806	38,615	45,231	-	-	-	1	1	45,232
Spruce										
Canada	7,942	307	-	8,249	-	-	-	-	-	-
Michigan	13,461	-	769	14,230	-	-	-	3	3	14,233
Minnesota	7,467	107,575	3,029	118,071	-	-	-	2,149	2,149	120,220
Wisconsin	37,575	42,074	36,043	115,693	-	-	-	1,114	1,114	116,806
Total	66,445	149,956	39,841	256,243	-	-	-	3,265	3,265	251,259
Tamarack										
Michigan	5,153	-	293	5,446	-	-	-	1	1	5,447
Minnesota	-	2,887	-	2,887	-	-	-	-	-	2,887
Wisconsin	1,199	9,329	8,003	18,531	-	-	-	-	-	18,531
Total	6,352	12,217	8,295	26,864	-	-	-	1	1	26,866
Total softwood roundwood										
Canada	15,434	307	-	15,741	-	-	-	-	-	-
Michigan	405,622	-	19,469	425,091	-	-	-	321	321	425,413
Minnesota	17,003	419,761	39,982	476,745	-	-	-	4,615	4,615	481,360
Wisconsin	139,228	61,864	785,076	986,167	-	-	-	1,114	1,114	987,281
Total	577,287	481,932	844,527	1,903,745	-	-	-	6,050	6,050	1,894,054
Residues										
Softwood										
Canada	-	13,281	-	13,281	-	-	-	-	-	-
Michigan	68,971	-	10,390	79,361	-	-	-	10,443	10,443	89,804
Minnesota	-	48,816	-	48,816	-	-	-	4,636	4,636	53,452
Wisconsin	20,884	2,228	180,410	203,523	1,564	49,459	31,699	14,727	97,449	300,971
Total	89,855	64,325	190,800	344,980	1,564	49,459	31,699	29,806	112,528	444,227
Total all softwood material										
Canada	15,434	13,588	-	29,022	-	-	-	-	-	-
Michigan	474,593	-	29,859	504,452	-	-	-	10,765	10,765	515,217
Minnesota	17,003	468,577	39,982	525,561	-	-	-	9,251	9,251	534,812
Wisconsin	160,112	64,092	965,486	1,189,690	1,564	49,459	31,699	15,841	98,562	1,288,252
Total	667,141	546,257	1,035,327	2,248,725	1,564	49,459	31,699	35,856	118,578	2,338,281

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State 2/			Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S. 3/	Canada		
Roundwood										
Ash										
Michigan	33,289	9	2,089	35,387	-	-	-	26	26	35,413
Wisconsin	3,599	1,040	74,260	78,899	-	-	-	-	-	78,899
Total	36,888	1,050	76,349	114,287	-	-	-	26	26	114,313
Aspen										
Michigan	861,751	-	32,162	893,913	-	-	-	48,477	48,477	942,390
Minnesota	854	2,038,937	28,133	2,067,923	-	3,177	-	120,741	123,918	2,191,842
Wisconsin	140,060	64,352	1,153,941	1,358,353	-	-	-	1,784	1,784	1,360,137
Total	1,002,665	2,103,289	1,214,236	4,320,190	-	3,177	-	171,002	174,180	4,494,369
Balsam poplar										
Michigan	53,936	-	3,477	57,413	-	-	-	94	94	57,507
Minnesota	-	95,723	47	95,769	-	51	-	11,229	11,280	107,049
Wisconsin	530	410	1,406	2,346	-	-	-	-	-	2,346
Total	54,466	96,132	4,930	155,528	-	51	-	11,322	11,373	166,902
Basswood										
Michigan	56,376	19	5,003	61,397	-	-	-	96	96	61,493
Wisconsin	1,976	9	47,649	49,633	-	-	-	-	-	49,633
Total	58,351	28	52,651	111,030	-	-	-	96	96	111,126
Beech										
Michigan	24,832	-	152	24,985	-	-	-	391	391	25,375
Wisconsin	3	-	745	748	-	-	-	-	-	748
Total	24,835	-	897	25,733	-	-	-	391	391	26,123
White birch										
Michigan	135,999	3,694	47,711	187,405	-	-	-	4,167	4,167	191,572
Minnesota	-	51,545	4,324	55,869	-	-	-	-	-	55,869
Wisconsin	9,190	44,122	234,883	288,196	-	-	-	1,091	1,091	289,286
Total	145,189	99,361	286,919	531,469	-	-	-	5,258	5,258	536,727
Yellow birch										
Michigan	30,903	19	4,653	35,575	-	-	-	424	424	35,999
Minnesota	-	11,305	-	11,305	-	-	-	-	-	11,305
Wisconsin	613	-	17,160	17,773	-	-	-	-	-	17,773
Total	31,516	11,324	21,813	64,653	-	-	-	424	424	65,077
Cottonwood										
Michigan	1,345	-	-	1,345	-	-	-	-	-	1,345
Wisconsin	-	-	1,555	1,555	-	-	-	-	-	1,555
Total	1,345	-	1,555	2,900	-	-	-	-	-	2,900
Elm										
Michigan	1,722	-	12	1,734	-	-	-	-	-	1,734
Wisconsin	229	-	24,871	25,101	-	-	-	-	-	25,101
Total	1,952	-	24,883	26,835	-	-	-	-	-	26,835
Hickory										
Michigan	261	-	-	261	-	-	-	-	-	261
Total	261	-	-	261	-	-	-	-	-	261
Hard maple										
Michigan	415,313	228	55,875	471,416	-	-	-	2,175	2,175	473,591
Minnesota	-	28	-	28	-	-	-	-	-	28
Wisconsin	9,067	2,887	190,002	201,957	-	-	-	-	-	201,957
Total	424,380	3,144	245,877	673,401	-	-	-	2,175	2,175	675,576
Soft maple										
Michigan	348,660	119	29,636	378,415	-	-	-	1,267	1,267	379,682
Minnesota	-	12,084	7,408	19,492	-	-	-	-	-	19,492
Wisconsin	5,987	1,391	149,848	157,226	-	-	-	-	-	157,226
Total	354,648	13,594	186,891	555,132	-	-	-	1,267	1,267	556,400
Red oak										
Michigan	75,053	13	2,981	78,046	-	-	-	40	40	78,086
Minnesota	-	109	-	109	-	-	-	-	-	109
Wisconsin	3,551	80	113,990	117,620	-	-	-	-	-	117,620
Total	78,603	202	116,971	195,776	-	-	-	40	40	195,815
White oak										
Michigan	25,404	-	-	25,404	-	-	-	-	-	25,404
Wisconsin	783	9	25,965	26,758	-	-	-	-	-	26,758
Total	26,187	9	25,965	52,161	-	-	-	-	-	52,161
Other hardwoods										
Michigan	15,296	3	1,069	16,368	-	-	-	14	14	16,382
Wisconsin	530	9	9,412	9,951	-	-	-	-	-	9,951
Total	15,825	12	10,482	26,319	-	-	-	14	14	26,333

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State 2/				Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin			Central States	Plains States	Other U.S. 3/	Canada		
Total hardwood roundwood											
Michigan	2,080,140	4,103	184,820	2,269,064	-	-	-	57,170	57,170	2,326,233	
Minnesota	854	2,209,730	39,911	2,250,495	-	3,228	-	131,970	135,198	2,385,693	
Wisconsin	176,118	114,310	2,045,687	2,336,115	-	-	-	2,875	2,875	2,338,990	
Total	2,257,112	2,328,144	2,270,418	6,855,674	-	3,228	-	192,015	195,243	7,050,917	
Residues											
Hardwood											
Canada	-	36,826	-	36,826	-	-	-	-	-	-	
Michigan	177,769	-	16,650	194,419	14,218	-	-	6,212	20,430	214,849	
Minnesota	-	60,099	-	60,099	-	-	-	670	670	60,768	
Wisconsin	10,074	-	156,939	167,012	-	-	-	-	-	167,012	
Other 4/	246	-	2,318	2,564	-	-	-	-	-	-	
Total	188,089	96,924	175,906	460,920	14,218	-	-	6,881	21,100	442,630	
Total all hardwood material											
Canada	-	36,826	-	36,826	-	-	-	-	-	-	
Michigan	2,257,909	4,103	201,470	2,463,482	14,218	-	-	63,382	77,600	2,541,082	
Minnesota	854	2,269,829	39,911	2,310,594	-	3,228	-	132,640	135,868	2,446,462	
Wisconsin	186,191	114,310	2,202,626	2,503,127	-	-	-	2,875	2,875	2,506,002	
Other 4/	246	-	2,318	2,564	-	-	-	-	-	-	
Total	2,445,201	2,425,068	2,446,325	7,316,594	14,218	3,228	-	198,896	216,342	7,493,546	
Total all roundwood											
Canada	15,434	307	-	15,741	-	-	-	-	-	-	
Michigan	2,485,763	4,103	204,289	2,694,155	-	-	-	57,491	57,491	2,751,646	
Minnesota	17,857	2,629,491	79,893	2,727,241	-	3,228	-	136,585	139,813	2,867,053	
Wisconsin	315,345	176,174	2,830,763	3,322,282	-	-	-	3,988	3,988	3,326,271	
Total	2,834,399	2,810,075	3,114,945	8,759,419	-	3,228	-	198,064	201,292	8,944,970	
Total all residues											
Canada	-	50,106	-	50,106	-	-	-	-	-	-	
Michigan	246,739	-	27,040	273,779	14,218	-	-	16,655	30,873	304,653	
Minnesota	-	108,915	-	108,915	-	-	-	5,306	5,306	114,220	
Wisconsin	30,958	2,228	337,349	370,535	1,564	49,459	31,699	14,727	97,449	467,984	
Other 4/	246	-	2,318	2,564	-	-	-	-	-	-	
Total	277,943	161,250	366,707	805,900	15,782	49,459	31,699	36,688	133,628	886,857	
Total all wood material											
Canada	15,434	50,413	-	65,847	-	-	-	-	-	-	
Michigan	2,732,502	4,103	231,329	2,967,934	14,218	-	-	74,146	88,365	3,056,299	
Minnesota	17,857	2,738,406	79,893	2,836,155	-	3,228	-	141,890	145,118	2,981,274	
Wisconsin	346,303	178,402	3,168,112	3,692,817	1,564	49,459	31,699	18,715	101,437	3,794,254	
Other 4/	246	-	2,318	2,564	-	-	-	-	-	-	
Total	3,112,342	2,971,325	3,481,652	9,565,319	15,782	52,687	31,699	234,752	334,920	9,831,827	

1/ Table may not add due to rounding.

2/ Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

3/ Mostly Western States.

4/ Pulpwood shipped to mills outside of region.

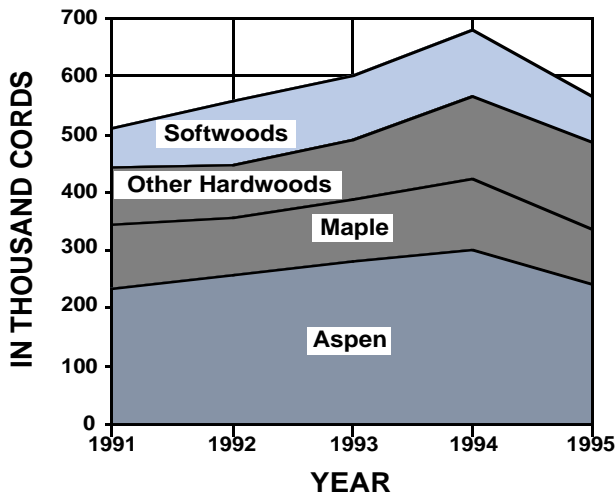


Figure 3.—Whole-tree-chip production in the Lake States, 1991-1995.

- Whole-tree-chip⁶ (WTC) production, which makes up 6 percent of the total pulpwood production in the Lake States, decreased 17 percent to 564 thousand cords in 1995 (fig. 3). Eleven of the 13 mills that used WTC in 1994 used less or no WTC in 1995.
- Michigan was the major producer of whole-tree chips in the Lake States in 1995 with 340 thousand cords (6 percent of the WTC production) (fig. 4).
- Aspen was the predominant species used in WTC in 1995 with 241 thousand cords, 43 percent of the total WTC production.
- Jack pine was the predominant softwood species used in WTC in 1995, making up 95 percent of the softwood WTC production and 13 percent of the total WTC production.

Michigan

- Michigan pulpwood production fell 4 percent to 3.1 million cords in 1995 (fig. 5).
- The Western Upper Peninsula was the top producing region in the State in 1995 with 41 percent of the roundwood harvested (fig. 6).

⁶Pulpwood produced from chipping entire trees (all portions of the trees above ground, except the stumps).

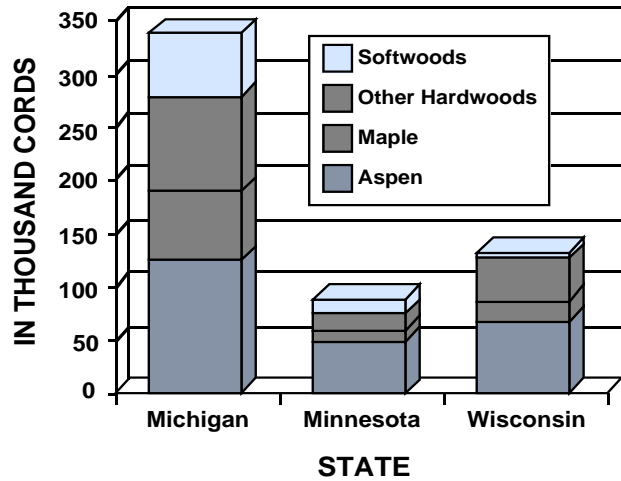


Figure 4.—WTC production by State in the Lake States, 1995.

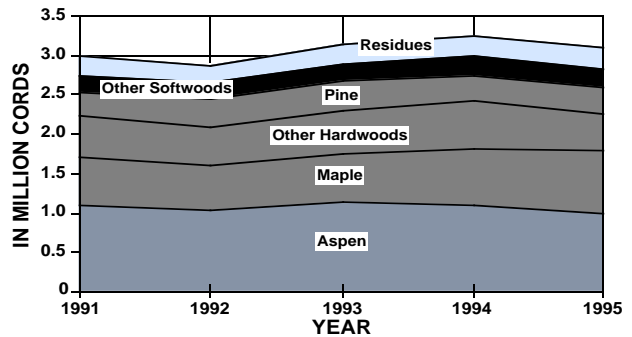


Figure 5.—Michigan pulpwood production by species group and residues, 1991-1995.

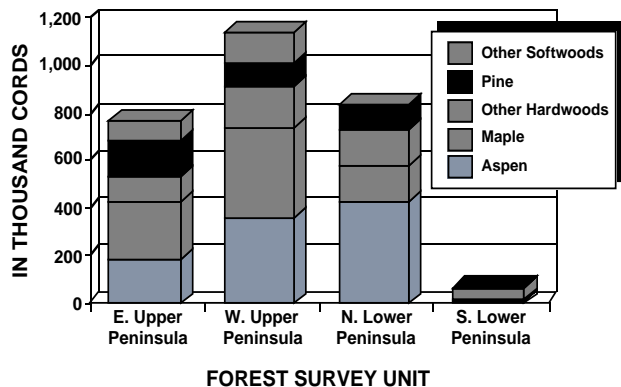


Figure 6.—Michigan roundwood pulpwood production by Forest Survey Unit and species groups, 1995.

- Marquette County in the Western Upper Peninsula was the top producer in the State with 316 thousand cords.
- Roundwood pulpwood production in 1995 increased 3 percent in the Southern Lower Peninsula, increased only 1 percent in the Western Upper Peninsula, remained the same in the Eastern Upper Peninsula, and decreased 18 percent in the Northern Lower Peninsula.

Minnesota

- Pulpwood production including residues decreased 2 percent to 3.0 million cords in 1995 (fig. 7).

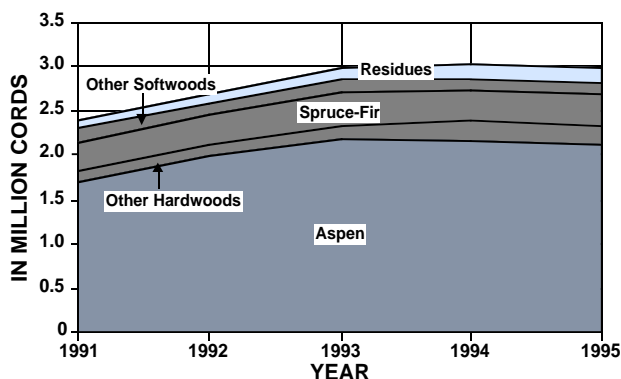


Figure 7.—Minnesota pulpwood production by species group and residues, 1991-1995.

- The Aspen-Birch and the Northern Pine Units were the top pulpwood producing areas in the State in 1995, each with 1.3 million cords (fig. 8).

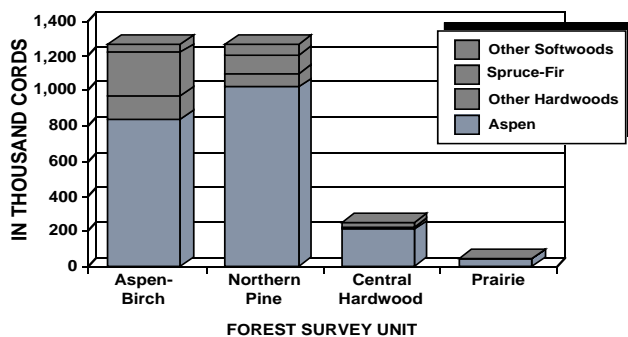


Figure 8.—Minnesota roundwood pulpwood production by Forest Survey Unit and species group, 1995.

- Aspen pulpwood production decreased 52 thousand cords in 1995 to 2.1 million cords, a 2-percent decrease from the previous year.
- Pulpwood production from hardwood residues increased 43 percent to 97 thousand cords in 1995.
- St. Louis County, in the Aspen-Birch Unit, remained the top producing county with 603 thousand cords, a 3-percent decrease from the previous year.
- Roundwood pulpwood production increased by 23 percent or 8 thousand cords in the Prairie Unit and by 9 percent or 20 thousand cords in the Central Hardwood Unit. It decreased by 2 percent or 20 thousand cords in the Northern Pine Unit and by 4 percent or 56 thousand cords in the Aspen-Birch Unit.

Wisconsin

- Pulpwood production in Wisconsin increased by less than 0.5 percent to 3.5 million cords, the only Lake State that did not report a decrease (fig. 9).

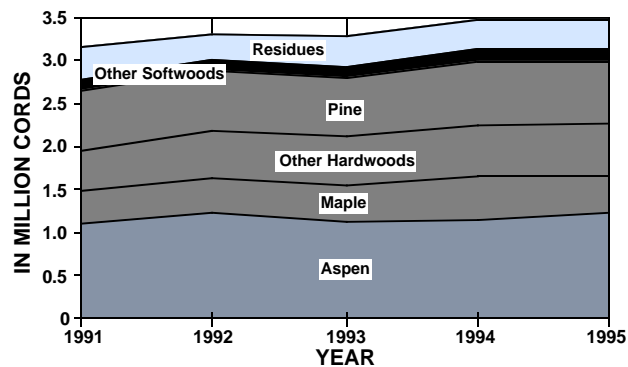


Figure 9.—Wisconsin pulpwood production by species group and residues, 1991-1995.

- Aspen harvests increased by 5 percent to 1.2 million cords in 1995, and accounted for 39 percent of the total harvest.
- Pine pulpwood production in Wisconsin accounted for 22 percent of the total harvest.
- The Northwest and Northeast Units were the top pulpwood producing areas in the State in 1995 with 1.3 million cords and 1.0 million cords, respectively (fig. 10).

- Douglas county in the Northwest Unit became the top pulpwood producing county in the State with 197 thousand cords.

Harvesting Intensity

- 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. 11); and second, the amount of pulpwood relative to commercial timberland area (fig. 12).

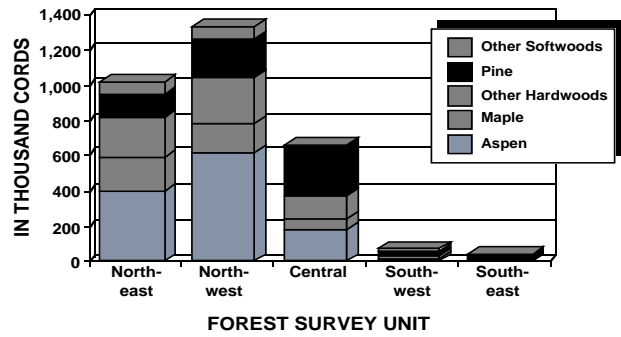


Figure 10. — Wisconsin roundwood pulpwood production by Forest Survey Unit and species group, 1995.

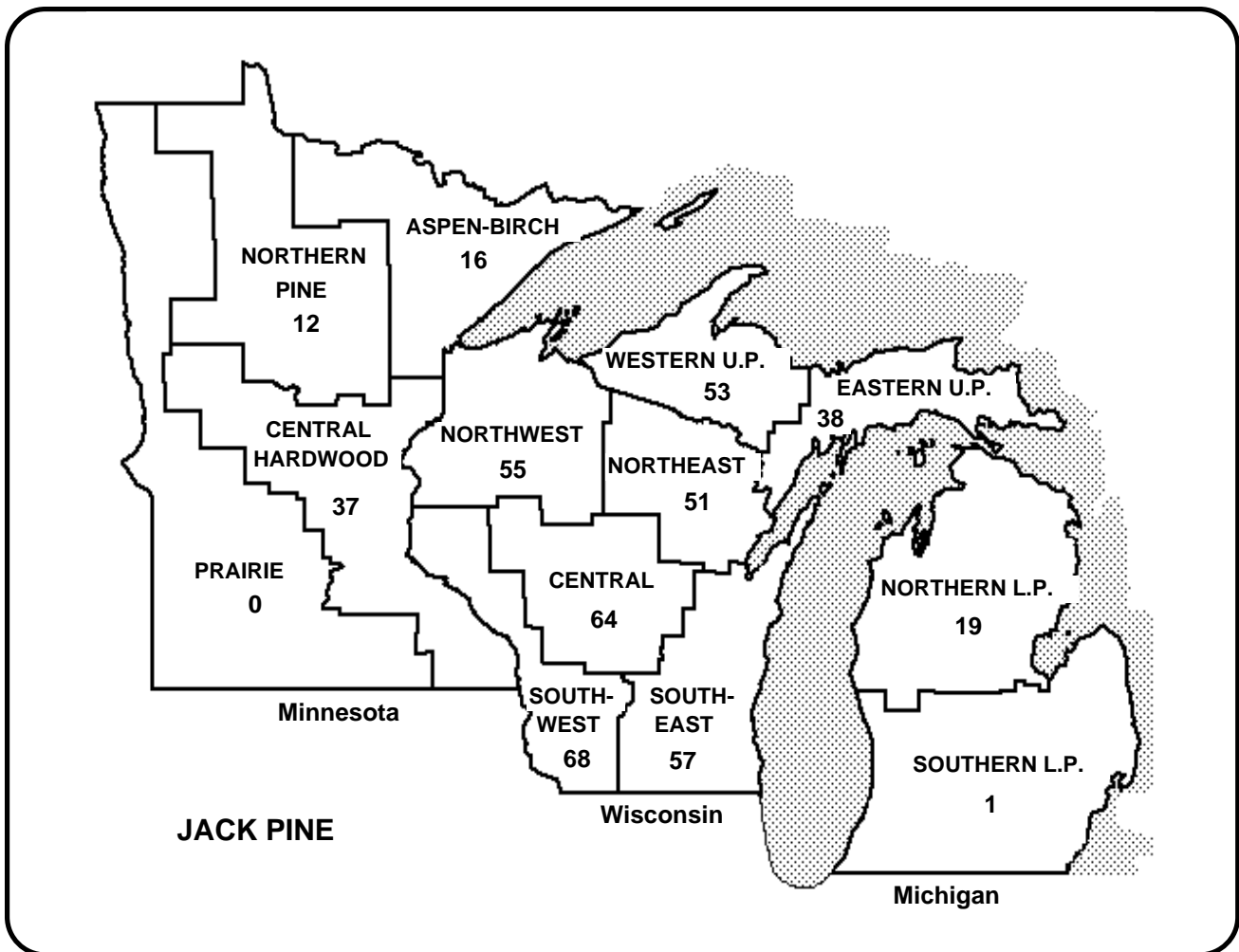
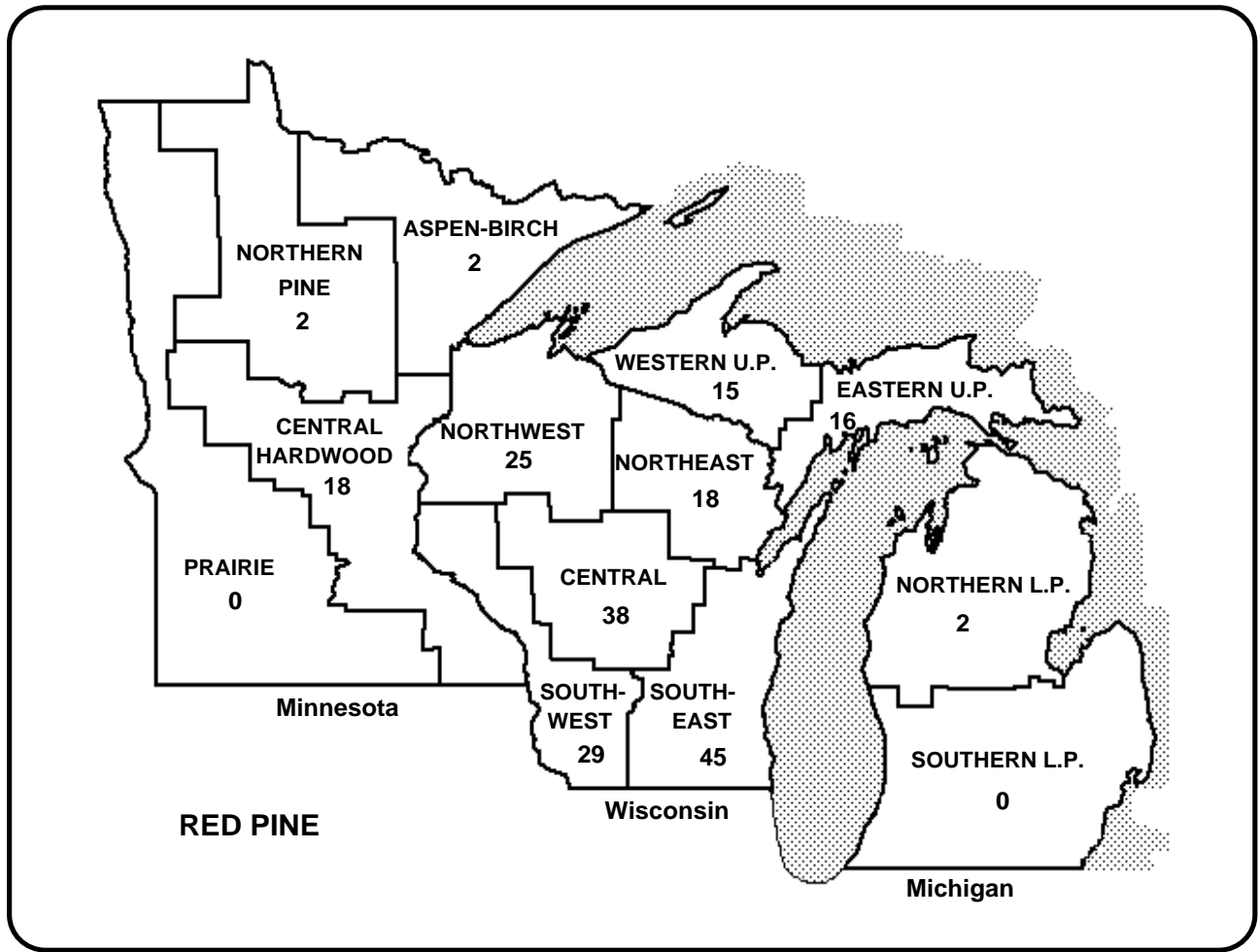
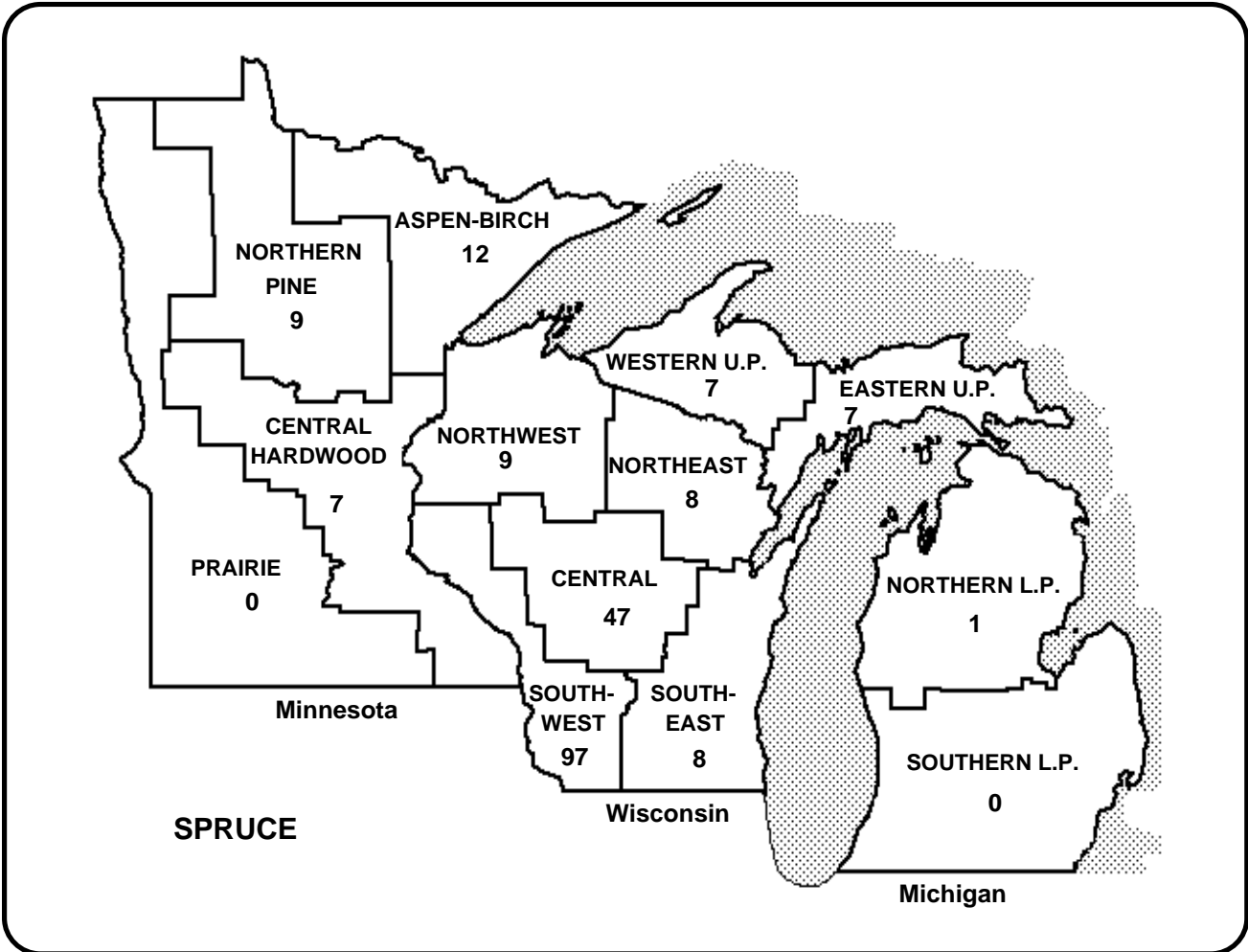
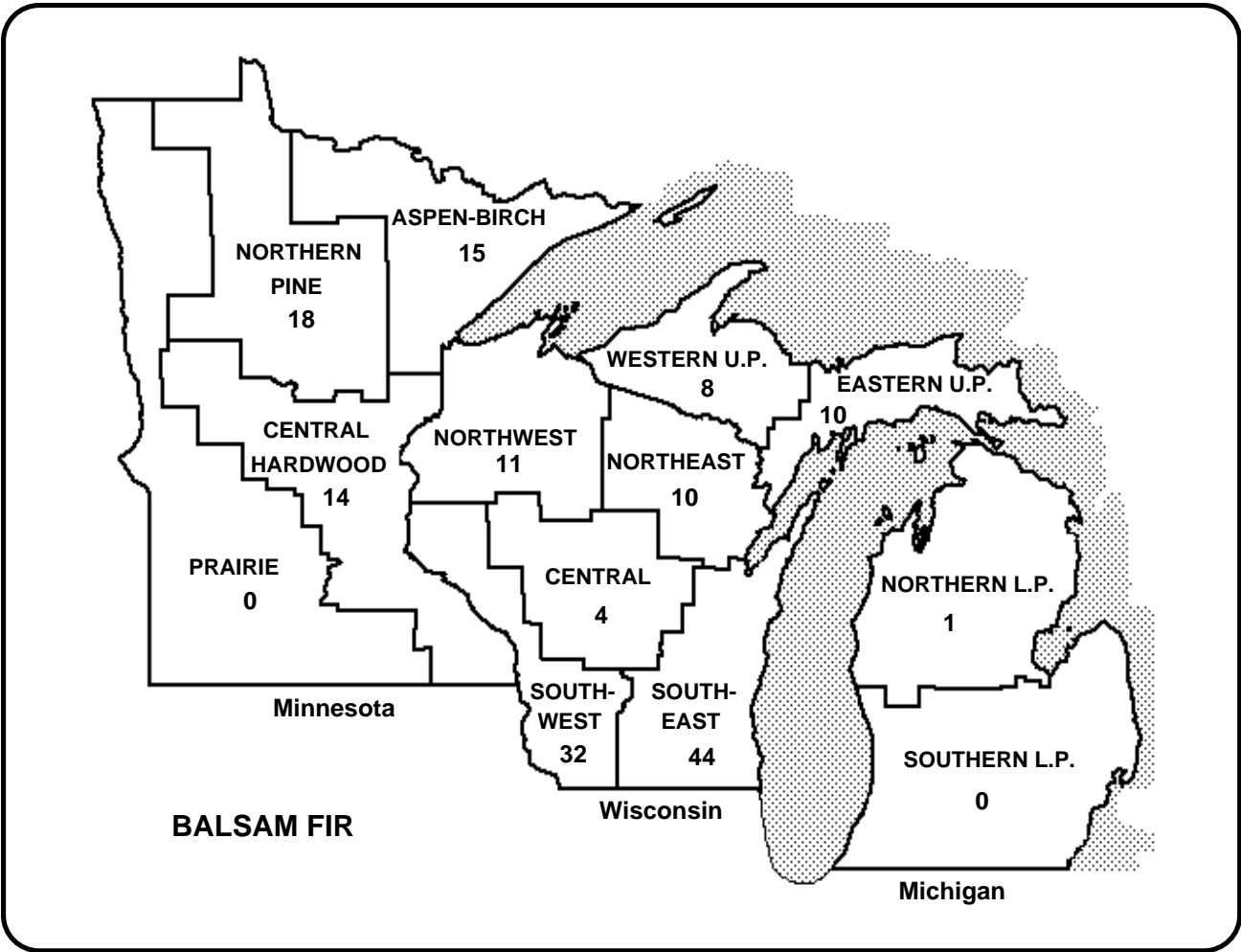
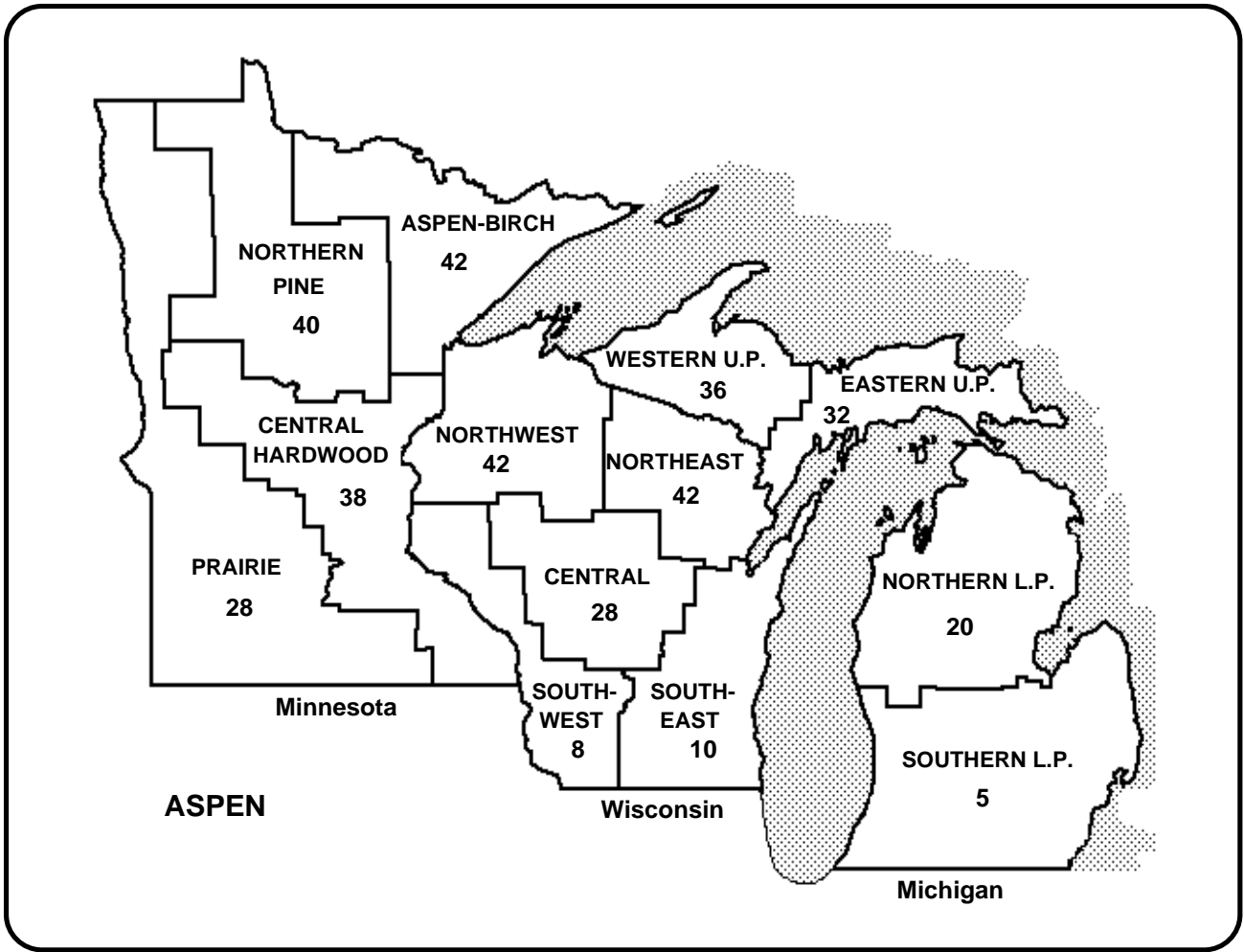


Figure 11.—Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of growing-stock volume for each of five principal pulpwood species by Forest Survey Unit, 1995. Growing-stock volume was determined during the last forest inventory in each State.









Pulpwood harvesting was most intensive in the following areas by species: (100,000 cords or more)

Species	State	Survey Unit
Jack pine	Wisconsin	Northwest, Central
Red pine	Wisconsin	Central
Spruce	Minnesota	Aspen-Birch
Balsam fir	Minnesota	Aspen-Birch
Aspen	Michigan	N. Lower Peninsula, W. Upper Peninsula, E. Upper Peninsula
	Minnesota	Northern Pine, Aspen-Birch, Central Hardwood
	Wisconsin	Northwest, Northeast, Central
White birch	Wisconsin	Northwest, Northeast
Hard maple	Michigan	W. Upper Peninsula, E. Upper Peninsula
	Wisconsin	Northeast
Soft maple	Michigan	W. Upper Peninsula, N. Lower Peninsula

RECEIPTS

- In 1995, 36 woodpulp and 14 particleboard mills in the Lake States acquired 9.8 million cords of pulpwood, down 2 percent from 1994 (fig. 13).
- In 1995, Michigan supplied wood to 33 mills, Wisconsin supplied 31 mills, and Minnesota supplied 30 mills.
- Total imports of roundwood increased 12 percent, with Canada supplying 98 percent of the total import volume.
- Softwood residue imported from Canada decreased by 10 percent in 1995 to 30 thousand cords. Softwood residue imported from States outside the region increased by 2 percent to 83 thousand cords. The main suppliers of the softwood residue from States outside the Lake States were South Dakota and Wyoming.
- Total imports of all wood material increased to 335 thousand cords, an 8-percent increase from 1994. Canada contributed 70 percent of the total import receipts.

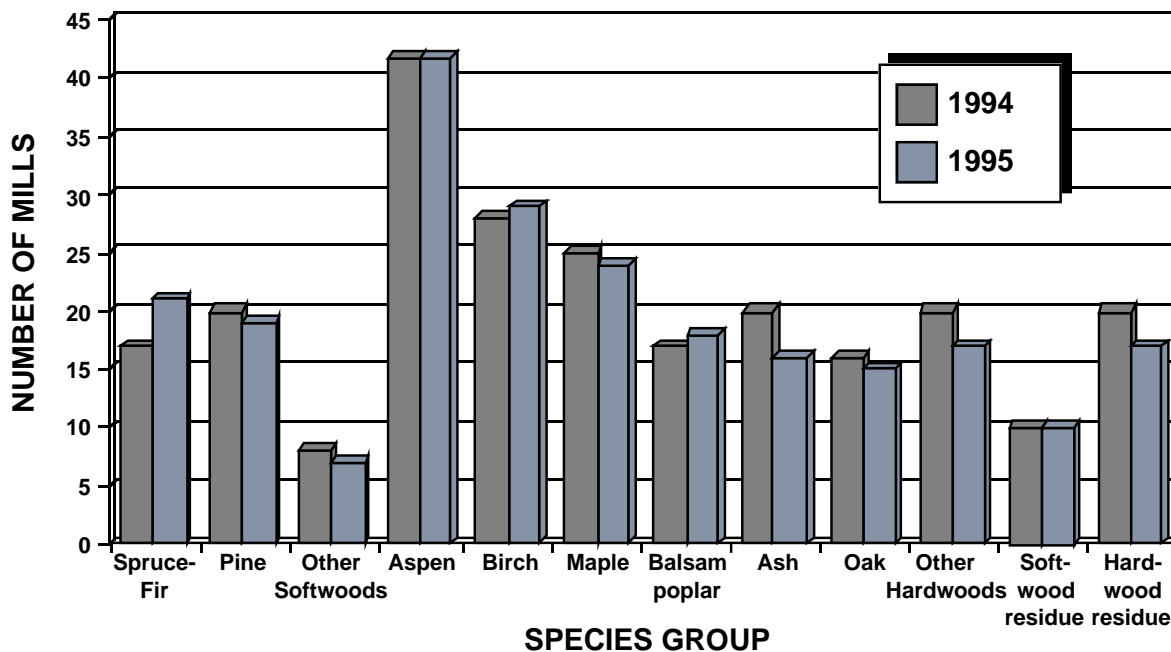


Figure 13.—Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard, 1994-1995.

Michigan

- Twelve Michigan mills consumed 3.1 million cords, down 6 percent from the previous year. Wisconsin provided 71 percent of the imported wood, and Canada provided 23 percent.

Minnesota

- The 16 mills in Minnesota reported consuming an estimated 3.0 million cords in 1995, a decrease of 1 percent from 1994. Canada furnished 58 percent of the 243 thousand cords that were imported.

Wisconsin

- The 22 mills in Wisconsin consumed 3.8 million cords in 1995, an increase of 1 percent from 1994. Of that total, 626 thousand cords were supplied by out-of-State sources, an increase of 8 percent from 1994.

- Principal species harvested for pulp were aspen (2,241 thousand cords), jack pine (620 thousand cords), hard maple (655 thousand cords), soft maple (482 thousand cords), and white birch (481 thousand cords) (fig. 14).

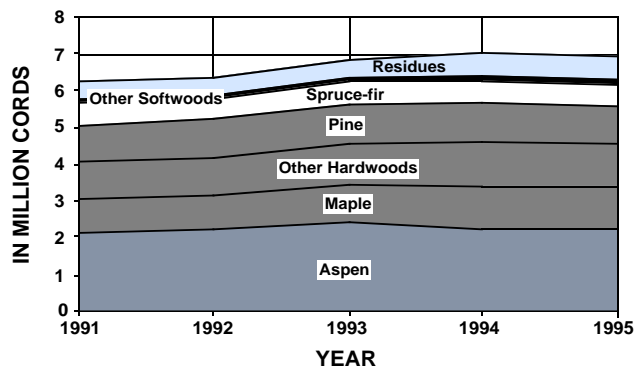


Figure 14.—Pulpwood production in the Lake States for pulp by species group and residues, 1991-1995.

INDUSTRY TRENDS AND ANALYSIS

Pulp Mills

In this section pulp mills include wood fiber products such as paper, paperboard, hardboard, insulation board and medium-density fiber board. All of these products are manufactured from wood that has been reduced to individual fibers, small fiber bundles, or fiber parts that are subsequently formed into a mat.

- Of the 9.6 million cords of pulpwood produced in 1995, 6.9 million cords (73 percent) were used for wood-pulp products. Of each cord used to produce pulp, 91 percent was roundwood and 9 percent was residues.

- Aspen and other hardwoods were still the mainstays of the pulp mills in the region in 1995, but softwood use had increased steadily since 1988.
- The use of softwood residues increased 57 percent from 1994 while hardwood residues decreased 11 percent.
- Average daily woodpulp production was 14.9 thousand tons in 1995 up from 13.5 thousand tons in 1994 (table 3).
- Lake States pulpwood production for pulp mills in 1991-1995 was:

Species	Production				
	1991	1992	1993	1994	1995
	----- (Thousand cords) -----				
Roundwood					
Softwoods	1,718	1,702	1,780	1,790	1,776
Aspen	2,095	2,184	2,427	2,253	2,241
Other hardwoods	1,948	2,041	2,113	2,351	2,291
Residue	506	471	514	594	642
Total	6,267	6,398	6,834	6,989	6,949

Michigan

- Pulpwood production for wood fiber was 2.3 million cords in 1995. Aspen was the major pulpwood species harvested in the State with 498 thousand cords, a 10-percent decrease from 1994.
- Michigan mills imported 241 thousand cords of pulpwood for processing: 199 thousand cords from Wisconsin, 4 thousand cords from Minnesota, and 37 thousand cords from Indiana and Canada combined. Michigan exported 349 thousand cords to Minnesota and Wisconsin, and 15 thousand cords to Canada.
- Michigan mills used 1,756 thousand cords of hardwood material in 1995, a decrease of 5 percent from 1994. The use of softwood material in 1995 increased by 7 percent to 501 thousand cords.

Minnesota

- Pulpwood production for wood pulp products totaled 1.7 million cords in 1995. Aspen was the predominant species harvested in the State with 961 thousand cords, only 2 thousand cords less than the previous year.
- Mills in Minnesota imported 213 thousand cords for pulp products: 80 thousand cords from Wisconsin, 18 thousand cords from Michigan, and 115 thousand cords from Canada. Minnesota exported 117 thousand cords to Wisconsin, 4 thousand cords to Michigan, and 50 thousand cords to Canada.
- In 1995, Minnesota mills had a 38-percent decrease in the use of softwood residues from 1994, a 1-percent decrease in the use of hardwood roundwood, a 0.5-percent increase in the use of softwood roundwood, and a 48-percent increase in the use of hardwood residues.

Wisconsin

- Pulpwood production for wood pulp products totaled 2.9 million cords in 1995. Aspen was the main species harvested with 781 thousand cords, a 6-percent increase from the previous year.

- Wisconsin mills imported 542 thousand cords of pulpwood: 331 thousand cords from Michigan, 117 thousand cords from Minnesota, 49 thousand cords from the Plains States, 3 thousand cords from other States (mostly Western States), and 1 thousand cords from Canada. Wisconsin exported 199 thousand cords to Michigan, 80 thousand cords to Minnesota, and 2 thousand cords to the Central States.
- In 1995, the use of softwoods in Wisconsin mills increased by 9 percent and hardwoods decreased by 2 percent.

Outlook

- While U.S. paper and paperboard production increased only one-half percent during 1995, the Lake States production of pulpwood for wood-pulp mills increased 1 percent.
- Total output of paper and paperboard in the U.S. in 1995 was 89.3 million tons (42.7 million tons of paper and 46.6 million tons of paperboard). The Lake States output of paper and paperboard was approximately 7 million tons or 8 percent of the total U.S. in 1994.
- Pulpwood consumption in the U.S. for 1995 totaled 101 million cords, a 5-percent decrease from 1994. Pulpwood consumption in the Lake States was 7 percent of that total.

Particleboard Mills

Particleboard is a generic term for a panel manufactured from lignocellulosic material—commonly wood—essentially in the form of particles (as distinct from fibers). These fibers are bonded together with synthetic resin or other suitable binder under heat and pressure, by a process in which the interparticle bonds are created wholly by the added binder and to which other materials may have been added during manufacture to improve certain properties. The many types of particleboard differ greatly in regard to size and geometry of the particle, the amount of resin (adhesive) used, and the density to which the panel is pressed. The major types of particles used for particleboard are shavings, flakes, wafers, chips, sawdust, strands, slivers, and wood wool

(excelsior). Most particleboard in the U.S. is made from residues (shavings, sawdust, or chips), but some types require that roundwood (saw logs or pulpwood) be used. Wafer board is an example of a product requiring that the particles be cut from solid wood. A new product called engineered lumber was added to this generic term in 1992.

- The Lake States produced 2.6 million cords of pulpwood in 1995 for particleboard products, down 5 percent from 1994. Of every cord of pulpwood used in particleboard manufacture, 94 percent came from roundwood and 6 percent was residues from wood-using plants (sawmills, veneer mills, etc.).
- Principal species harvested for particleboard products were aspen (2,079 thousand cords), jack pine (98 thousand cords), soft maple (73 thousand cords), and balsam poplar (61 thousand cords) (fig. 15).
- Total softwood roundwood used for particleboard products decreased from 149 thousand cords in 1994 to 128 thousand cords in 1995, a decrease of 14 percent. Softwood residue use increased 9 percent—from 74 thousand cords in 1994 to 81 thousand cords in 1995.

- The use of hardwood roundwood decreased from 2,449 thousand cords in 1994 to 2,324 thousand cords in 1995, a decrease of 5 percent. Hardwood residue use decreased 5 percent—from 87 thousand cords in 1994 to 82 thousand cords in 1995.

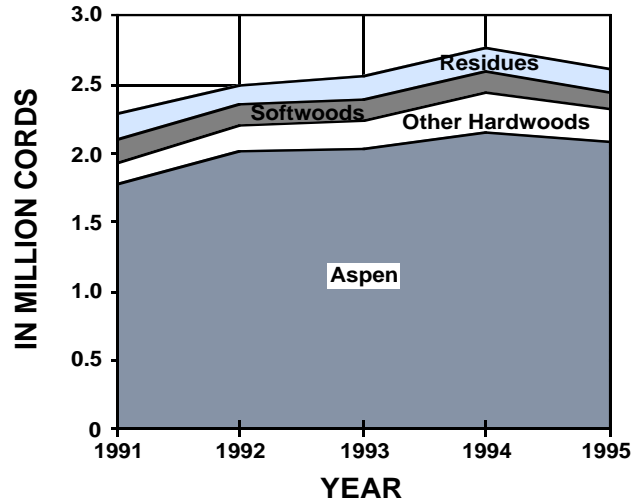


Figure 15.—Pulpwood production for particleboard in the Lake States, 1991-1995.

- Annual production capacity of the Lake States particleboard product plants is:

Particleboard and panel: Company and product	Location	Production capacity (Million square feet 3/4-inch basis)
Georgia-Pacific - Particleboard	Gaylord, MI	234
Louisiana-Pacific - Waferboard	Hayward, WI	241
Louisiana-Pacific - OSB*	Newberry, MI	61
Louisiana-Pacific - OSB*	Sagola, MI	175
Louisiana-Pacific - OSB*	Tomahawk, WI	84
Louisiana-Pacific - OSB*	Two Harbors, MN	61
Northwood Panelboard Co. - OSB*	Solway, MN	170
Potlatch Corp. - OSB*	Bemidji, MN	240
Potlatch Corp. - OSB*	Cook, MN	130
Potlatch Corp. - OSB*	Grand Rapids, MN	170
Rodman Industries - Particleboard	Marinette, WI	5
Weyerhaeuser Co. - OSB*	Grayling, MI	192
Weyerhaeuser Co. - Particleboard	Marshfield, WI	70
All particleboard companies		1,833

* Oriented strand board

- Lake States pulpwood production for particleboard mills in 1991-1995 was:

Species	Production				
	1991	1992	1993	1994	1995
	----- (Thousand cords) -----				
Roundwood					
Softwoods	158	157	152	149	128
Aspen	1,786	2,050	2,028	2,146	2,079
Other hardwoods	148	183	204	303	245
Residue	194	142	175	161	163
Total	2,286	2,532	2,559	2,759	2,616

- National housing starts decreased 7 percent in 1995 to 1.35 million units. Rising mortgage rates and increased prices for building materials helped contribute to the 5-percent decrease in Lakes States pulpwood production for particleboard products.

Michigan

- Pulpwood harvested for particleboard products totaled 761 thousand cords in 1995; aspen made up 504 thousand cords of that total. Residues used for particleboard products added another 95 thousand cords.
- The particleboard mills in Michigan imported 32 thousand cords of aspen from Wisconsin and 51 thousand cords from Canada. Raw materials exported for particleboard production amounted to 16 thousand cords.

Minnesota

- Timber logged for particleboard products totaled 1.2 million cords (50 percent of the Lake States total). The predominant species cut was aspen with 1.1 million cords, or 94 percent of the total.
- The particleboard mills in Minnesota imported 27 thousand cords from Canada and 3 thousand cords from the Plains States. In 1995, raw materials exported from the State for particleboard manufacturing totaled 61 thousand cords.

Wisconsin

- Wisconsin produced 471 thousand cords of roundwood for particleboard manufacturing. The main species harvested was aspen with 433 thousand cords, or 92 percent of the total.
- The mills in Wisconsin imported 84 thousand cords of wood for particleboard manufacturing: 61 thousand cords from Minnesota, 16 thousand cords from Michigan, and 7 thousand cords from Canada. Wisconsin exported 32 thousand cords to Michigan particleboard mills in 1995.

New Mills, Expansions, and Closures

At the time of this report, major pulp mill expansion, new construction, and closures are as follows:

- Aspen Bay Pulp and Fibre is building the first bleached chemi-thermomechanical pulp mill in the U.S. in Menominee, Michigan. The 215,000 tons per year mill should be finished by late 1997.
- Badger Paper Mill's Inc., Peshtigo, Wisconsin, closed its pulp mill June, 1996.
- G-P Flakeboard Limited completed construction of a medium density fiberboard (MDF) operation in Sault Ste. Marie, Ontario, Canada. The plant began operation early in 1996.

- Potlatch Corp. Cloquet, Minnesota, is re-building the bleached kraft pulp mill, which will double its capacity by 1999.
- Potlatch Corp. Cook, Minnesota, is doubling the capacity of its oriented strand board (OSB) mill; construction could be complete by 1998.

CENTRAL STATES

PRODUCTION

- Pulpwood production in the Central States (Illinois, Indiana, Iowa, and Missouri) increased 59 percent—from 333 thousand cords in 1994 to 528 thousand cords in 1995 (fig. 16). Indiana production rose 111 percent, Missouri rose 28 percent, Illinois rose 7 percent, and Iowa rose 6 percent above the 1994 production level.
- Two mills were added in the Central States that were not surveyed in previous years. When these two mills are omitted, pulpwood production in the Central States increased only 16 percent and Indiana's production rose only 15 percent. Throughout the rest of the Central States section, these two mills are included in the comparison of data.
- The Central States have recovered from the flooding of 1993. Pulpwood production is 48 percent over the preflood figures for 1992.

- Hardwood residue from primary wood-using mills made up 68 percent of total production in 1995. Softwood residue from primary wood-using mills increased 73 percent from 1994.
- Central States production for roundwood pulpwood was 132 thousand cords in 1995, up 37 percent from 1994. Pulpwood production from soft hardwood⁷ roundwood rose from 29 thousand cords in 1994 to 32 thousand cords in 1995 or 11 percent. Hard hardwood⁸ production also increased from 58 thousand cords in 1994 to 89 thousand cords in 1995 or 55 percent.
- Exports of roundwood and residues from the Central States in 1995 increased 20 percent to 249 thousand cords. Central States pulpwood was shipped to Kentucky, Wisconsin, Ohio, and Michigan mills.
- Loggers harvested pulpwood in 14 counties of Illinois, 14 counties in Indiana, 8 counties in Iowa, and 12 counties in Missouri (fig. 17).

⁷Hardwood species with an average specific gravity of 0.50 or less.

⁸Hardwood species with an average specific gravity greater than 0.50.

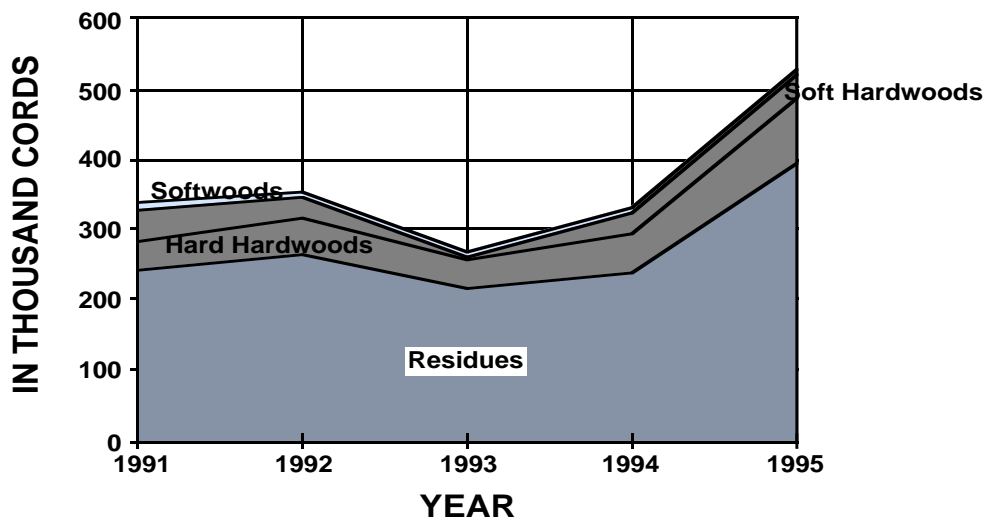


Figure 16.—Pulpwood production in the Central States, 1991-1995.

CENTRAL STATES

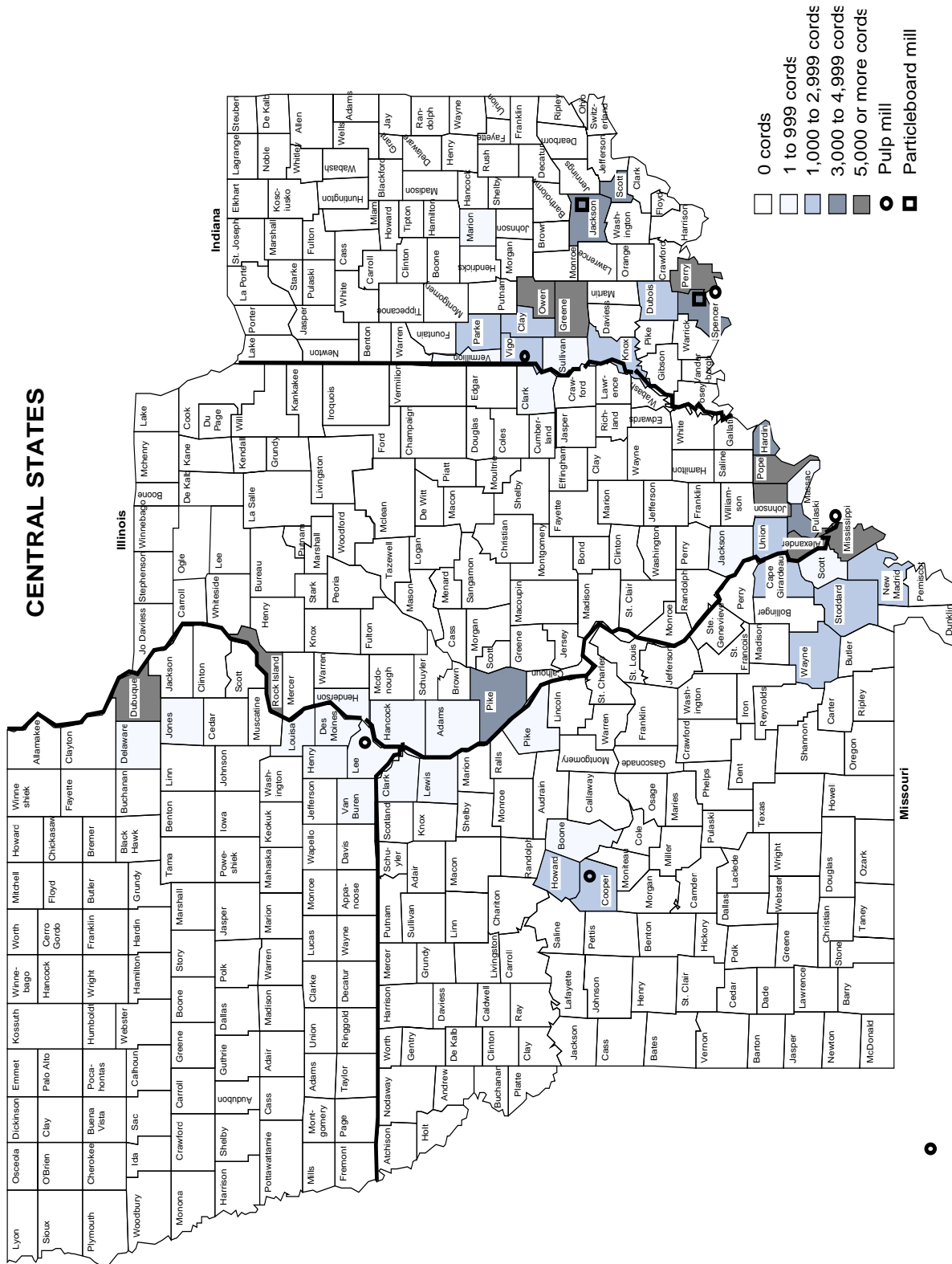


Figure 17. --- Production of pulpwood from roundwood (including chips from roundwood) in the Central States by counties, in standard cords, 1995. Locations of Central States and nearby pulp and particleboard mills using Central States pulpwood are shown.

- Whole-tree chips made up 9 percent of the pulpwood production for the Central States in 1995. The 42 thousand cords of whole tree chips were a 44-percent increase from the 1994 volume.

Illinois

- Illinois produced 81 thousand cords of pulpwood in 1995, up 7 percent from 1994. Illinois contributed 15 percent of the total production in the Central States in 1995 (fig. 18).

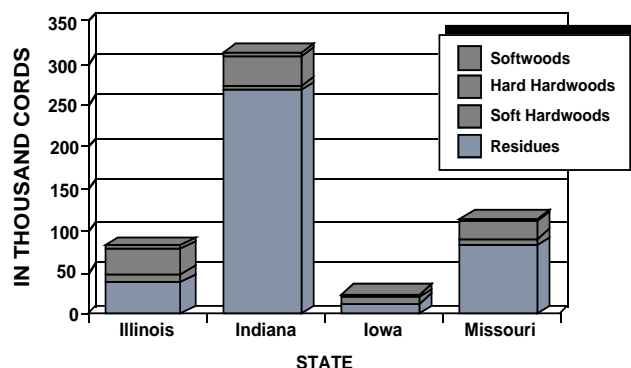


Figure 18.—Central States pulpwood production by species group and residues, 1995.

- Illinois does not have any primary woodpulp or particleboard mills; consequently, all pulpwood harvested is shipped to plants outside the State.

Indiana

- Pulpwood production in Indiana accounted for 59 percent of the total pulpwood produced in the Central States region in 1995, or 310 (169) thousand cords, a 111-percent increase from 1994.
- Pulpwood shipped to mills outside the North-Central Region totaled 84 thousand cords, 27 percent of the State's total pulpwood production. The remaining 73 percent was used by mills in the Central and Lakes States regions.

Iowa

- The total pulpwood production in 1995 was 23 thousand cords, 4 percent of the region's total.
- Hardwood residues accounted for 49 percent of Iowa's pulpwood production in 1995, soft hardwood roundwood accounted for 31 percent, hard hardwood roundwood accounted for 13 percent, and softwood residues accounted for 7 percent.
- Production of soft hardwood and hard hardwood pulpwood remained at 1994 volumes. Hardwood residues decreased by 2 percent. Softwood residues were used for pulpwood production for the first time since 1986.

Missouri

- Missouri was the second largest producer of pulpwood in the Central States in 1995, at 113 thousand cords or 21 percent of the region's total. Missouri pulpwood production increased 29 percent from 1994.
- Missouri exported 101 thousand cords or 90 percent of the State's pulpwood production to mills in the Southern Region.

RECEIPTS

- Pulp and particleboard mills in three Central States received 297 thousand cords in 1995, up 133 percent from 1994.
- Hardwood residue receipts increased 138 percent from 86 thousand cords in 1994 to 204 thousand cords in 1995.
- Softwoods were used for pulpwood for the first time since 1983 in the Central States.

INDUSTRY TRENDS AND ANALYSIS

- Average daily woodpulp production increased 1 percent in 1995 to 833 tons (table 5).
- With the addition of two particleboard mills to the survey, 52 percent of the pulpwood produced remained within the Central States, compared to only 38 percent in 1994.

- Hardwood residue from sawmills continues to be the dominant form of pulpwood procured for Central States pulp and particle-board mills.

PLAINS STATES

PRODUCTION AND RECEIPTS

- Pulpwood production in the Plains States was 115 thousand cords in 1995, an increase of 4 percent from 1994. It came from Kansas, North Dakota, and South Dakota (fig. 19).

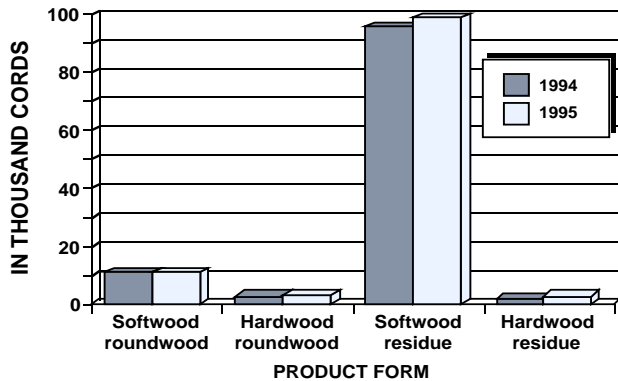


Figure 19.—Pulpwood production in the Plains States, 1994-1995.

- Softwood residue accounted for 86 percent of the pulpwood production for the Plains States in 1995, all of which came from South Dakota (fig. 20).

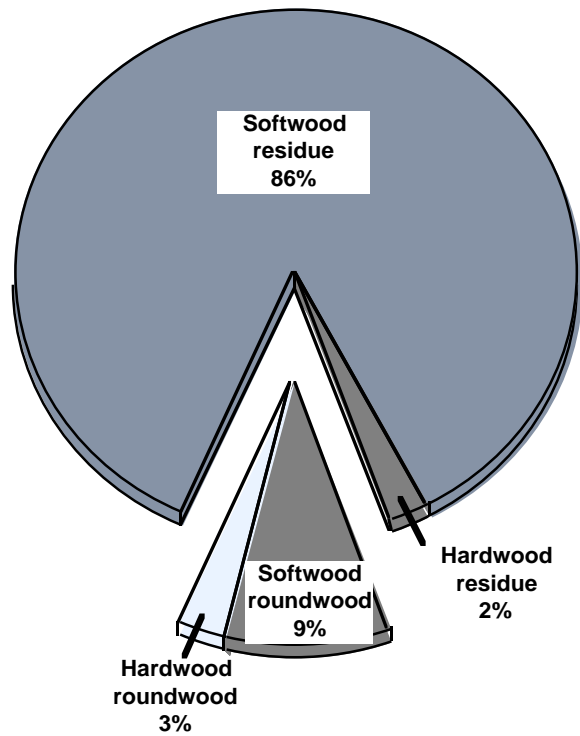


Figure 20.—Plains States pulpwood production, 1995.

- Forty-nine thousand cords of softwood residue from the Plains States were exported to Wisconsin in 1995. An additional 3 thousand cords of hardwood residues were sent to Oklahoma.
- Three thousand cords of soft hardwood roundwood from the Plains States were exported to Minnesota in 1995.
- The Plains States imported 58 thousand cords of softwood residue from Wyoming in 1995.
- All of the pulpwood received in the Plains States was processed at Merillat Industries, Inc., in Rapid City, South Dakota, a particleboard mill that has a production capacity of 95 million square feet 3/4 basis.

APPENDIX

Conversion Factors Used in the North-Central Region

Standard cords of green roundwood per green ton:

Species	Factor	Species	Factor
Softwoods	0.4688	White birch	0.4018
N. white cedar	.6329	Yellow birch	.3723
Balsam fir	.4688	River birch	.3871
Hemlock	.4150	Sweetgum	.3669
Jack pine	.4688	Yellow-poplar	.4219
Red pine	.4688	Blackgum	.3779
White pine	.4777	Sycamore	.4083
Shortleaf pine	.3956	Cottonwood	.4291
Spruce	.5014	Elm	.4018
Tamarack	.4291	Hickory	.3701
Hardwoods	.3939	Hard maple	.3617
Soft hardwoods	.4171	Soft maple	.4083
Hard hardwoods	.3708	Black cherry	.4688
Ash	.4330	Red oak	.3444
Aspen	.4291	White oak	.3723
Balsam poplar	.4083	Black oak	.3444
Basswood	.5167	Other hardwoods	.4777
Beech	.3956		

Table 2.--Numbers of industrial plants in the Lake States using a particular species or residue for pulping or particleboard in 1995

Product form and species group	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Roundwood				
Softwoods				
Cedar	2	2	-	-
Balsam fir	18	4	5	9
Hemlock	5	1	-	4
Jack pine	17	3	8	6
Red pine	15	3	6	6
White pine	10	2	2	6
Spruce	16	3	6	7
Tamarack	5	1	1	3
Total plants using softwood roundwood 1/	26	5	11	10
Hardwoods				
Ash	16	7	-	9
Aspen	42	10	15	17
Balsam poplar	18	7	8	3
Basswood	15	9	-	6
Beech	9	8	-	1
White birch	27	9	7	11
Yellow birch	12	6	1	5
Cottonwood	3	1	-	2
Elm	6	3	-	3
Hickory	1	1	-	-
Hard maple	21	10	1	10
Soft maple	23	10	2	11
Red oak	15	8	1	6
White oak	7	4	-	3
Other hardwoods	8	5	-	3
Total plants using hardwood roundwood 1/	47	11	15	21
Total plants using roundwood 1/	49	12	16	21
Residues				
Softwood	10	2	1	7
Hardwood	17	7	3	7
Total plants using residues 1/	19	7	3	9
Total plants 1/	50	12	16	22

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

Table 3. -- Average daily production of active woodpulp mills in the Lake States by mill, location, and type of pulp produced, 1995

(In tons per 24 hours)

Company	Location	All types	Type of pulp					
			Sulfite	Kraft	Groundwood/mechanical	Semi-chemical	Thermo-chemical	Thermo-mechanical
Michigan								
ABT Co.	Alpena	400	-	-	400	-	-	-
American Fibrit Inc.	Battle Creek	30	-	-	-	-	30	-
Champion International Corp.	Quinnesec	1,150	-	1,150	-	-	-	-
Mead Corp.	Escanaba	1,500	-	1,500	-	-	-	-
Menasha Corp.	Otsego	350	-	-	-	350	-	-
S. D. Warren Co.	Muskegon	300	-	300	-	-	-	-
Stone Container Corp.	Ontonagon	737	-	-	-	737	-	-
TENNECO Packaging	Manistee	900	-	-	-	900	-	-
Total	8 mills	5,367	-	2,950	400	1,987	30	-
Minnesota								
Blandin Paper Co.	Grand Rapids	550	-	-	550	-	-	-
Boise Cascade Corp.	International Falls	977	-	977	-	-	-	-
Certain-Teed Corp.	Shakepee	235	-	-	-	-	235	-
Champion International Corp.	Sartell	370	-	-	-	-	-	370
Georgia-Pacific Corp.	Bemidji	100	-	-	100	-	-	-
Georgia-Pacific Corp.	Duluth	350	-	-	350	-	-	-
Hennepin Paper Co.	Little Falls	100	-	-	100	-	-	-
International Bildrite, Inc.	International Falls	110	-	-	110	-	-	-
Lake Superior Paper Industry	Duluth	440	-	-	440	-	-	-
Potlatch Corp.	Cloquet	520	-	520	-	-	-	-
Total	10 mills	3,752	-	1,497	1,650	-	235	370
Wisconsin								
Appleton Papers Inc.	Combined Locks	200	-	-	-	200	-	-
Badger Paper Mills Inc.	Peshigo	101	101	-	-	-	-	-
Consolidated Papers Inc.	Biron	216	-	-	216	-	-	-
Consolidated Papers Inc.	Stevens Point	123	-	-	123	-	-	-
Consolidated Papers Inc.	Wisconsin Rapids	1,116	-	1,116	-	-	-	-
Cross Pointe Paper Corp.	Park Falls	170	170	-	-	-	-	-
Georgia-Pacific Corp.	Nekoosa	390	-	390	-	-	-	-
Georgia-Pacific Corp.	Phillips	75	-	-	75	-	-	-
Georgia-Pacific Corp.	Port Edwards	230	230	-	-	-	-	-
Georgia-Pacific Corp.	Superior	140	-	-	140	-	-	-
Globe Building Materials Inc.	Cornell	105	-	-	-	-	-	105
Mosinee Paper Corp.	Mosinee	285	-	285	-	-	-	-
Niagara of WI Paper Corp.	Niagara	280	-	-	280	-	-	-
Repap Wisconsin Inc.	Kimberly	120	-	-	120	-	-	-
TENNECO Packaging	Tomahawk	1,378	-	-	-	1,378	-	-
Thilmany Paper	Kaukauna	421	-	421	-	-	-	-
Wausau Paper Mills Corp.	Brokaw	265	265	-	-	-	-	-
Weyerhaeuser Paper Co.	Rothschild	135	135	-	-	-	-	-
Total	18 mills	5,750	901	2,212	954	1,578	-	105
Lake States total	36 mills	14,869	901	6,659	3,004	3,565	265	475

Table 4.--Production and imports of pulpwood, Central States and Plain States, 1995 1/

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State 2/					Regional Total	Imports		Total imports	Total receipts
	Illinois	Indiana	Iowa	Missouri	Plains States 3/		Lake States	Other U.S.		
Roundwood										
Softwoods										
Northeastern States	-	3,597	-	-	-	3,597	-	-	-	-
Plain States	-	-	-	-	10,800	10,800	-	-	-	10,800
Southern States	4,981	-	-	1,164	-	6,145	-	-	-	-
Total	4,981	3,597	-	1,164	10,800	20,542	-	-	-	10,800
Soft hardwoods 4/										
Central States	8,228	5,364	7,164	5,736	-	26,493	-	-	-	26,493
Lake States	-	-	-	-	3,228	3,228	-	-	-	-
Northeastern States	-	11	-	-	-	11	-	-	-	-
Southern States	3,237	-	-	2,740	-	5,977	-	-	-	-
Total	11,465	5,375	7,164	8,476	3,228	35,708	-	-	-	26,493
Hard hardwoods 5/										
Central States	3,873	19,878	3,134	505	-	27,390	-	-	-	27,390
Northeastern States	-	14	-	-	-	14	-	-	-	-
Southern States	25,000	15,556	-	21,357	-	61,912	-	-	-	-
Total	28,873	35,448	3,134	21,861	-	89,316	-	-	-	27,390
Total roundwood										
Central States	12,102	25,242	10,298	6,240	-	53,882	-	-	-	53,882
Lake States	-	-	-	-	3,228	3,228	-	-	-	-
Northeastern States	-	3,622	-	-	-	3,622	-	-	-	-
Plain States	-	-	-	-	10,800	10,800	-	-	-	10,800
Southern States	33,218	15,556	-	25,261	-	74,034	-	-	-	-
Total	45,320	44,419	10,298	31,501	14,028	145,567	-	-	-	64,683
Residues										
Softwoods										
Central States	-	35,280	-	-	-	35,280	-	3,920	3,920	39,200
Lake States	-	-	1,564	-	49,459	51,023	-	-	-	-
Plain States	-	-	-	-	48,839	48,839	-	58,000	58,000	106,839
Southern States	-	23	-	2,734	-	2,758	-	-	-	-
Total	0	35,303	1,564	2,734	98,298	137,900	-	61,920	61,920	146,039
Hardwoods										
Central States	20,822	151,853	11,435	5,579	-	189,690	2,318	11,760	14,078	203,768
Lake States	-	14,218	-	-	-	14,218	-	-	-	-
Northeastern States	-	2,384	-	-	-	2,384	-	-	-	-
Southern States	15,053	62,243	-	72,954	2,545	152,795	-	-	-	-
Total	35,875	230,698	11,435	78,533	2,545	359,087	2,318	11,760	14,078	203,768
Total Residues										
Central States	20,822	187,133	11,435	5,579	-	224,970	2,318	15,680	17,998	242,968
Lake States	-	14,218	1,564	-	49,459	65,241	-	-	-	-
Northeastern States	-	2,384	-	-	-	2,384	-	-	-	-
Plain States	-	-	-	-	48,839	48,839	-	58,000	58,000	106,839
Southern States	15,053	62,267	-	75,688	2,545	155,552	-	-	-	-
Total	35,875	266,002	12,999	81,267	100,843	496,986	2,318	73,680	75,998	349,807
All wood material										
Central States	32,924	212,375	21,734	11,820	-	278,852	2,318	15,680	17,998	296,850
Lake States	-	14,218	1,564	-	52,687	68,469	-	-	-	-
Northeastern States	-	6,006	-	-	-	6,006	-	-	-	-
Plain States	-	-	-	-	59,639	59,639	-	58,000	58,000	117,639
Southern States	48,270	77,822	-	100,948	2,545	229,586	-	-	-	-
Total	81,195	310,421	23,298	112,768	114,871	642,553	2,318	73,680	75,998	414,490

1/ Table may not add due to rounding.

2/ Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

3/ Includes Kansas, Nebraska, South Dakota, and North Dakota.

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

5/ Hardwood species with an average specific gravity greater than 0.50.

Table 5. -- Average production of active woodpulp and particleboard mills in the Central States
by mill type, mill, location, and type of pulp produced, 1995

Pulp

(In tons per 24 hours)

Company	Location	All types	Type of pulp	
			Groundwood/ mechanical	Semi- chemical
The Weston Paper and Mfg. Co.	Terre Haute, Indiana	557	-	557
Four M Paper Corp.	Fort Madison, Iowa	201	-	201
Huebert Fiberboard Co.	Boonville, Missouri	75	75	-
Central States total	3 mills	833	75	758

Particleboard

(In million square feet 3/4-inch basis per year)

Company	Location	Total
Swain Industries	Evanston, Indiana	9
Swain Industries	Seymour, Indiana	8
Central States total	2 mills	17

Table 6. -- Lake States pulpwood production by State of origin and destination, 1991-1995

(In thousand cords, unpeeled) 1/

MICHIGAN					
Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 2/
1991	3,016	2,687	5	304	20
1992	2,877	2,533	3	323	18
1993	3,154	2,859	11	272	13
1994	3,254	2,915	17	310	11
1995	3,112	2,733	18	346	16
5-year average	3,083	2,745	11	311	16

MINNESOTA					
Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 2/
1991	2,391	-	2,269	101	21
1992	2,672	-	2,520	105	47
1993	2,969	-	2,783	146	39
1994	3,029	11	2,812	164	41
1995	2,971	4	2,738	178	50
5-year average	2,806	3	2,624	139	40

WISCONSIN					
Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 2/
1991	3,146	274	69	2,799	4
1992	3,296	253	56	2,987	-
1993	3,270	244	55	2,970	1
1994	3,465	241	55	3,167	2
1995	3,482	231	80	3,168	2
5-year average	3,332	249	63	3,018	2

1/ Includes mill residues used for pulp.

2/ Includes Canada.

Table 7.--Lake States pulpwood production by Forest Survey Unit
and destination by State, 1995

(In thousand standard cords, unpeeled)

MICHIGAN					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 1/
Roundwood					
Eastern Upper Peninsula	774	685	-	79	10
Western Upper Peninsula	1,149	910	18	217	4
Northern Lower Peninsula	845	825	-	19	1
Southern Lower Peninsula	66	66	-	-	-
Total	2,834	2,486	18	315	15
Residues	278	247	-	31	-
Total pulpwood	3,112	2,733	18	346	16

MINNESOTA					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 1/
Roundwood					
Aspen-Birch	1,263	1	1,161	100	(2/)
Northern Pine	1,263	3	1,243	17	-
Central Hardwood	242	-	183	59	-
Prairie	43	-	43	1/	-
Total	2,810	4	2,629	176	1/
Residues	161	-	109	2	50
Total pulpwood	2,971	4	2,738	178	50

WISCONSIN					
Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other 1/
Roundwood					
Northeastern	1,020	176	2	843	-
Northwestern	1,334	21	78	1,236	-
Central	661	-	-	661	-
Southwestern	65	-	(2/)	64	-
Southeastern	35	8	-	27	-
Total	3,115	204	80	2,831	-
Residues	367	27	-	337	2
Total pulpwood	3,482	231	80	3,168	2

1/ Includes Canada

2/ Less than 500 standard cords, unpeeled.

Table 8. -- Lake States annual pulpwood production from roundwood by species group, State, and Forest Survey Unit, 1991-1995

(In thousand standard cords, unpeeled)

MICHIGAN															
Forest Survey Unit	All species					Pine					Spruce				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
Eastern Upper Peninsula	760	720	778	773	774	109	128	149	111	147	22	26	27	23	27
Western Upper Peninsula	1,045	1,101	1,051	1,140	1,149	88	125	115	101	99	40	43	39	38	39
Northern Lower Peninsula	923	788	1	1,035	845	112	110	116	132	108	1	1	2	1	1
Southern Lower Peninsula	35	39	64	65	66	(1/)	(1/)	(1/)	(1/)	(1/)	-	-	-	-	-
Total	2,763	2,649	2,909	3,013	2,834	309	363	380	344	355	64	70	67	62	66
MINNESOTA															
Aspen-Birch	979	1,129	1,330	1,318	1,263	55	49	56	46	40	110	115	125	137	118
Northern Pine	1,209	1,299	1,341	1,283	1,263	98	68	81	60	65	31	30	33	29	31
Central Hardwood	106	136	163	222	242	10	20	20	14	17	1	1	1	1	1
Prairie	12	20	23	35	43	-	(1/)	(1/)	-	-	-	-	-	-	-
Total	2,306	2,585	2,857	2,858	2,810	164	136	156	120	122	141	146	158	165	150
WISCONSIN															
Northeast	1,055	1,117	1,054	1,066	1,020	145	142	141	135	132	17	18	13	12	16
Northwest	1,097	1,201	1,221	1,312	1,334	211	204	225	242	228	15	20	19	16	19
Central	550	574	575	640	661	277	276	277	307	285	1	2	1	1	3
Southwest	63	81	58	65	65	50	47	34	38	33	(1/)	1	1	1	2
Southeast	20	35	30	38	35	13	26	15	15	17	(1/)	1	(1/)	1	1
Total	2,784	3,008	2,937	3,121	3,115	695	695	692	738	695	33	51	34	31	40
Total Lake States	7,853	8,242	8,703	8,992	8,759	1,168	1,195	1,228	1,201	1,172	237	257	259	258	256

(Table 8 continued on next page.)

(Table 8 continued.)

MICHIGAN															
Forest Survey Unit	Balsam fir					Other softwoods					Aspen				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
Eastern Upper Peninsula	63	44	55	55	34	27	26	25	43	30	210	200	211	181	192
Western Upper Peninsula	37	36	44	45	43	26	24	24	41	46	368	367	373	360	368
Northern Lower Peninsula	3	3	3	2	2	(1/)	(1/)	(1/)	(1/)	(1/)	510	460	545	527	429
Southern Lower Peninsula	-	-	-	-	-	-	-	-	(1/)	-	6	7	13	16	13
Total	103	83	101	103	79	63	50	49	84	76	1,093	1,033	1,142	1,084	1,003
MINNESOTA															
Aspen-Birch	106	104	114	114	119	3	1	2	2	11	643	782	925	862	831
Northern Pine	90	81	84	70	76	1	1	1	1	2	959	1,073	1,105	1,061	1,021
Central Hardwood	(1/)	2	2	1	2	(1/)	-	-	-	(1/)	84	110	131	197	209
Prairie	-	-	11	-	-	-	-	-	-	(1/)	12	20	23	35	43
Total	197	187	199	185	198	4	1	3	3	12	1,698	1,985	2,185	2,155	2,103
WISCONSIN															
Northeast	31	29	30	31	30	29	24	20	32	27	414	452	405	393	397
Northwest	33	32	31	31	41	9	8	9	9	7	513	554	544	573	614
Central	(1/)	(1/)	1	(1/)	1	2	2	2	2	2	149	175	152	163	179
Southwest	-	(1/)	(1/)	(1/)	(1/)	-	(1/)	(1/)	-	(1/)	11	29	18	17	17
Southeast	(1/)	(1/)	(1/)	(1/)	1	(1/)	(1/)	(1/)	(1/)	(1/)	3	6	10	13	8
Total	64	61	61	63	73	40	34	31	42	37	1,090	1,216	1,129	1,159	1,214
Total Lake States	364	331	361	351	350	106	85	83	129	125	3,881	4,234	4,455	4,399	4,320

(Table 8 continued on next page.)

(Table 8 continued.)

MICHIGAN															
Forest Survey Unit	Birch					Maple					Other hardwoods				
	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995	1991	1992	1993	1994	1995
Eastern Upper Peninsula	66	61	64	75	51	180	156	193	215	237	66	79	55	71	57
Western Upper Peninsula	82	86	81	87	84	306	312	280	351	375	85	108	95	117	94
Northern Lower Peninsula	41	35	51	50	42	137	111	143	163	156	110	69	156	160	106
Southern Lower Peninsula	(1/)	(1/)	2	1	(1/)	6	8	14	8	11	23	25	36	40	42
Total	188	183	197	213	177	630	586	630	736	779	284	281	342	387	299
MINNESOTA															
Aspen-Birch	10	18	27	44	65	7	4	11	10	9	45	57	72	103	70
Northern Pine	2	6	11	30	38	9	6	7	10	4	19	33	20	23	27
Central Hardwood	1	1	3	1	8	5	2	4	6	4	5	2	2	2	(1/)
Prairie	-	-	-	-	(1/)	-	-	-	-	-	(1/)	(1/)	(1/)	-	1
Total	14	25	42	75	111	20	12	21	26	17	70	92	94	128	97
WISCONSIN															
Northeast	137	146	129	116	123	183	191	209	226	194	75	115	107	121	101
Northwest	104	134	114	126	152	133	150	170	205	172	54	100	108	110	101
Central	27	25	17	18	28	59	55	49	60	59	25	38	77	89	104
Southwest	1	1	1	1	3	1	2	2	4	5	(1/)	1	2	5	6
Southeast	(1/)	(1/)	(1/)	1	2	2	1	2	2	3	(1/)	1	3	5	3
Total	268	307	261	263	309	378	399	431	496	433	155	255	298	329	315
Total Lake States	470	515	500	550	596	1,028	997	1,083	1,259	1,229	509	628	734	845	711

1/ Less than 500 cords.

Table 9.--Pulpwood production from roundwood by county and species group, Michigan, 1995

(In standard cords, unpeeled)

Unit and county	All species	Species group										
		N. white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
Eastern Upper Peninsula												
Alger	144,926	397	5,454	5,732	9,156	7,470	386	5,516	505	1,347	27,816	2,466
Chippewa	104,644	236	4,270	1,624	16,624	8,497	285	3,016	281	456	32,319	6,687
Delta	138,878	486	6,579	4,807	19,200	7,394	454	2,684	652	837	34,319	2,742
Luce	73,690	119	1,834	5,567	10,470	5,185	111	2,422	261	584	12,857	525
Mackinac	85,746	244	5,842	1,276	5,114	5,090	163	2,503	219	413	29,820	6,365
Menominee	98,558	234	3,998	2,666	3,138	1,961	302	1,661	325	688	38,656	2,275
Schoolcraft	127,805	410	5,994	3,071	26,361	19,286	553	8,859	649	859	16,269	1,132
Total	774,247	2,127	33,972	24,743	90,062	54,883	2,254	26,662	2,892	5,184	192,057	22,193
Western Upper Peninsula												
Baraga	97,832	76	1,946	3,576	3,616	1,789	71	1,601	428	1,506	29,513	2,883
Dickinson	102,490	273	4,914	2,118	5,880	3,694	269	4,346	347	591	48,091	2,126
Gogebic	96,719	1	3,064	735	307	108	37	5,792	15	2,042	22,277	1,397
Houghton	187,379	182	3,242	3,196	8,695	1,972	268	2,918	231	3,663	47,126	4,341
Iron	190,684	434	13,803	3,699	9,239	6,446	502	8,824	717	1,550	64,778	5,047
Keweenaw	12,780	--	42	43	13	14	--	--	--	202	1,704	--
Marquette	316,092	1,014	13,960	26,051	38,866	13,784	1,087	12,395	1,625	1,835	75,779	6,717
Ontonagon	144,761	32	2,021	1,499	1,171	1,300	337	3,046	97	1,626	78,769	5,054
Total	1,148,734	2,012	42,991	40,917	67,788	29,107	2,572	38,921	3,460	13,016	368,038	27,566
Northern Lower Peninsula												
Alcona	32,135	--	47	--	323	166	--	--	--	615	22,286	1,448
Alpena	26,887	--	76	--	--	--	--	--	--	624	16,288	354
Antrim	6,062	--	--	--	104	78	--	--	--	158	2,530	--
Arenac	10,048	--	--	--	502	37	--	--	--	144	7,135	16
Bay	5,928	--	--	--	35	--	--	--	--	149	2,886	--
Benzie	19,765	--	--	--	1,868	871	--	--	--	504	6,917	--
Charlevoix	10,904	--	--	--	67	271	--	--	--	131	3,569	--
Cheboygan	47,547	113	1,285	--	5,474	269	46	447	--	173	30,311	318
Clare	37,375	--	--	--	1,501	1,137	--	--	--	810	25,360	91
Crawford	55,362	--	--	--	7,905	17,609	536	--	--	384	17,093	--
Emmet	29,121	--	--	--	1,652	653	24	--	--	37	9,762	--
Gladwin	11,598	--	--	--	257	234	--	--	--	152	8,524	43
Grand Traverse	11,887	--	--	--	1,216	2,703	--	--	--	345	2,442	43
Iosco	14,001	--	61	--	280	288	--	--	--	275	8,634	265
Isabella	20,638	--	--	--	138	264	--	--	--	943	12,284	--
Kalkaska	28,184	15	120	--	3,607	1,510	29	29	--	479	12,940	7
Lake	28,849	--	--	--	1,203	141	--	--	--	587	10,493	2
Leelanau	4,589	--	--	--	8	39	--	--	--	141	1,697	--
Manistee	26,389	--	--	--	173	275	--	--	--	834	12,097	--
Mason	24,714	--	--	--	--	--	--	--	--	465	13,642	1
Mecosta	13,719	--	--	--	143	295	--	--	--	280	10,245	--
Midland	13,676	--	--	--	52	9	--	--	--	213	9,237	5
Missaukee	28,984	--	--	--	3,933	1,842	26	--	--	322	16,146	10
Montmorency	44,379	5	54	--	654	148	2	20	--	846	27,984	611
Newaygo	29,209	--	--	--	19	1,217	--	--	--	1,101	11,099	3
Oceana	11,299	--	--	--	22	49	--	--	--	513	6,260	--
Ogemaw	32,396	23	183	--	9,332	115	83	44	--	258	13,031	342
Osceola	48,325	--	--	--	93	119	--	--	--	1,826	25,953	--
Oscoda	30,223	--	53	--	9,194	53	87	41	--	306	13,542	201
Otsego	35,652	5	39	--	9,964	321	105	10	--	261	15,110	16
Presque Isle	47,992	18	449	--	3,436	273	21	262	--	620	27,047	892
Roscommon	41,721	5	42	--	8,373	645	26	10	--	158	22,462	10
Wexford	15,381	--	--	--	1,922	2,271	--	--	--	425	4,493	29
Total	844,938	184	2,409	--	73,450	33,901	985	862	--	15,077	429,499	4,708
Southern Lower Peninsula												
Allegan	11,589	--	--	--	--	--	--	--	--	--	2,617	--
Barry	1,899	--	--	--	--	--	--	--	--	--	429	--
Berrien	2,231	--	--	--	--	--	--	--	--	--	257	--
Cass	2,351	--	--	--	--	--	--	--	--	--	270	--
Gratiot	792	--	--	--	--	--	--	--	--	156	159	--
Huron	947	--	--	--	--	23	--	--	--	--	773	--
Ionia	710	--	--	--	--	--	--	--	--	--	82	--
Kalamazoo	1,295	--	--	--	--	--	--	--	--	--	129	--
Kent	5,908	--	--	--	41	--	--	--	--	162	1,038	--
Montcalm	14,208	--	--	--	70	--	--	--	--	1,889	3,536	--
Muskegon	14,315	--	--	--	--	--	--	--	--	1,104	1,917	--
Ottawa	4,162	--	--	--	--	--	--	--	--	299	566	--
Sanilac	270	--	--	--	--	--	--	--	--	--	260	--
St Joseph	2,636	--	--	--	--	--	--	--	--	--	300	--
Tuscola	472	--	--	--	--	--	--	--	--	--	416	--
Van Buren	2,694	--	--	--	--	--	--	--	--	--	322	--
Total	66,480	--	--	--	111	23	--	--	--	3,611	13,072	--
State total	2,834,399	4,323	79,372	65,660	231,411	117,913	5,810	66,445	6,352	36,888	1,002,665	54,466

(Table 9 continued on next page)

(Table 9 continued)

Unit and county	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
Eastern Upper Peninsula												
Alger	1,770	2,860	5,550	2,444	--	12	--	38,733	24,222	1,476	33	1,580
Chippewa	757	1,063	4,724	644	--	10	--	11,979	10,359	427	--	386
Delta	1,220	2,087	8,739	1,715	--	7	--	26,280	16,570	871	2	1,235
Luce	827	1,153	2,243	1,028	--	1	--	17,322	9,869	752	--	558
Mackinac	616	887	5,619	668	--	3	--	10,968	9,093	370	13	460
Menominee	921	1,137	11,216	1,034	--	14	--	16,861	10,083	751	42	594
Schoolcraft	928	1,606	4,015	1,384	--	13	--	21,469	13,147	828	60	914
Total	7,040	10,792	42,106	8,917	--	60	--	143,611	93,342	5,474	150	5,727
Western Upper Peninsula												
Baraga	3,004	167	6,376	2,500	--	26	--	24,028	12,614	1,551	94	465
Dickinson	1,089	119	7,724	959	--	108	--	11,890	6,880	725	36	310
Gogebic	3,110	6	3,065	2,425	--	22	--	31,426	16,801	3,158	102	829
Houghton	7,333	1,052	10,244	6,268	--	42	--	53,765	28,010	3,345	178	1,309
Iron	2,842	710	12,137	2,726	--	38	--	34,069	20,101	1,832	109	1,079
Keweenaw	453	--	879	453	--	--	--	5,648	2,925	303	--	101
Marquette	2,511	4,524	17,517	3,667	--	27	--	54,757	35,440	1,718	48	2,770
Ontonagon	3,950	42	3,329	3,598	--	26	--	26,259	10,318	1,836	66	384
Total	24,293	6,619	61,270	22,596	--	290	--	241,841	133,089	14,469	633	7,246
Northern Lower Peninsula												
Alcona	473	31	2,193	--	--	--	--	456	3,979	107	13	--
Alpena	294	117	1,121	--	2/	12	--	386	7,592	22	--	--
Antrim	194	86	543	--	--	1	--	930	1,341	97	--	--
Arenac	116	46	620	--	2/	12	--	268	1,152	--	--	--
Bay	120	48	414	--	2/	12	--	234	1,942	66	21	--
Benzie	1,178	737	929	3	2/	7	--	3,167	2,611	468	81	423
Charlevoix	3,245	95	348	--	2/	7	--	2,193	977	--	--	--
Cheboygan	342	141	2,701	--	--	--	--	1,022	4,782	124	--	--
Clare	609	258	1,508	--	3	60	--	1,269	4,418	238	100	11
Crawford	549	182	1,703	--	1	24	--	1,385	5,034	2,897	59	--
Emmet	2,196	66	1,230	--	--	--	--	1,744	10,886	--	--	870
Gladwin	120	47	811	--	2/	11	--	228	992	149	30	--
Grand Traverse	720	184	444	--	--	4	--	1,536	1,534	369	179	170
Iosco	170	59	1,714	--	2/	9	--	256	1,943	42	5	--
Isabella	822	304	1,267	--	4	79	--	1,541	2,991	--	--	--
Kalkaska	1,401	214	1,379	--	1	26	--	1,562	4,483	324	58	--
Lake	543	255	1,191	--	2	42	--	1,061	2,681	8,361	2,223	66
Leelanau	211	147	298	--	--	2	--	924	754	351	--	17
Manistee	588	424	1,531	--	2	42	--	1,674	4,288	3,654	625	183
Mason	506	305	1,633	--	1	35	--	958	2,117	3,907	1,124	20
Mecosta	225	97	489	--	1	22	--	478	1,058	285	96	3
Midland	182	74	909	--	1	14	--	425	2,352	141	60	--
Missaukee	344	232	963	--	--	12	--	1,146	3,107	542	311	49
Montmorency	2,048	150	2,169	--	--	--	--	1,101	7,991	594	1	--
Newaygo	832	391	1,308	--	4	76	--	1,788	3,646	5,460	2,211	55
Oceana	454	203	775	--	3	41	--	942	1,464	445	129	--
Ogemaw	544	91	1,599	--	2/	10	--	590	2,648	3,443	51	9
Osceola	1,280	871	2,806	--	2	100	--	3,101	5,992	5,067	1,024	92
Oscoda	328	88	1,264	--	--	2	--	495	2,512	1,996	60	--
Otsego	3,199	90	490	--	--	--	--	1,795	2,153	1,340	10	745
Presque Isle	797	119	3,227	--	--	--	--	472	10,343	14	--	--
Roscommon	71	45	1,643	--	--	4	--	700	6,230	1,279	18	--
Wexford	468	219	478	--	2/	16	--	1,586	2,450	664	220	139
Total	25,168	6,415	41,700	3	30	683	--	37,412	118,445	42,444	8,711	2,852
Southern Lower Peninsula												
Allegan	--	--	--	--	--	--	--	--	1,868	3,413	3,690	--
Barry	--	--	--	--	--	--	--	--	286	569	615	--
Berrien	--	--	--	--	--	--	--	--	408	752	813	--
Cass	--	--	--	--	--	--	--	--	408	803	869	--
Gratiot	80	36	4	--	57	40	12	62	186	--	--	--
Huron	--	--	23	--	--	--	--	18	110	--	--	--
Ionia	--	--	--	--	--	--	--	72	82	228	246	--
Kalamazoo	--	--	--	--	--	--	--	--	204	463	500	--
Kent	79	36	4	--	57	41	12	63	1,015	1,622	1,738	--
Montcalm	993	424	48	--	700	481	135	749	2,604	1,275	1,304	--
Muskegon	541	248	27	--	389	281	80	431	1,296	4,196	3,805	--
Ottawa	158	266	7	--	111	76	22	119	646	918	973	--
Sanilac	--	--	--	--	--	--	--	--	9	--	--	--
St Joseph	--	--	--	--	--	--	--	--	286	985	1,065	--
Tuscola	--	--	--	--	--	--	--	--	56	--	--	--
Van Buren	--	--	--	--	--	--	--	--	306	993	1,073	--
Total	1,851	1,009	114	--	1,315	919	261	1,516	9,771	16,217	16,693	--
State total	58,351	24,835	145,189	31,516	1,345	1,952	261	424,380	354,648	78,603	26,187	15,825

Table 10.--Pulpwood production from roundwood by county and species group, Minnesota, 1995

(In standard cords, unpeeled)

Unit and county	All species	Species group										
		N. white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
Aspen-Birch												
Carlton	55,090	-	8,938	-	2,844	832	21	2,130	141	21	26,812	347
Cook	31,122	-	4,705	-	1,374	452	9	10,096	172	-	10,131	26
Koochiching	461,192	-	28,167	-	5,543	1,049	136	49,840	7,081	199	324,602	42,982
Lake	112,373	-	11,211	-	4,001	1,556	221	16,751	990	429	55,771	2,311
St Louis	602,842	-	66,029	-	20,446	1,455	278	39,271	2,192	216	413,845	22,917
Total	1,262,618	-	119,051	-	34,208	5,345	666	118,088	10,575	864	831,161	68,583
Northern Pine												
Aitkin	100,280	-	5,111	-	1,282	577	-	1,314	-	85	86,705	1,136
Becker	75,887	-	882	-	1,744	146	-	-	-	-	71,833	445
Beltrami	178,869	-	4,815	-	5,007	429	-	5,812	1,175	-	146,345	8,735
Cass	180,619	-	7,699	-	7,601	2,419	-	920	-	-	152,106	2,862
Clearwater	80,357	-	2,370	-	859	115	10	510	-	-	73,578	1,224
Crow Wing	65,206	-	-	-	5,389	1,574	-	19	-	-	57,438	20
Hubbard	108,406	-	490	-	5,700	1,078	-	75	-	-	93,886	2,195
Itasca	357,459	-	52,884	-	7,241	1,718	10	19,652	73	40	252,011	8,288
Lake of the Woods	50,480	-	2,088	-	10,395	48	-	1,929	57	-	34,915	996
Mahnomen	15,083	-	-	-	16	-	-	-	-	-	14,987	69
Roseau	28,742	-	13	-	8,124	8	-	384	198	-	19,205	808
Wadena	21,161	-	-	-	2,978	437	-	64	-	-	17,638	22
Total	1,262,547	-	76,351	-	56,336	8,549	20	30,678	1,503	125	1,020,648	26,800
Central Hardwood												
Anoka	541	-	-	-	-	463	-	11	-	-	66	-
Benton	531	-	-	-	-	353	-	-	-	-	178	-
Chisago	1,932	-	-	-	-	1,733	-	125	-	8	10	-
Douglas	1,512	-	-	-	-	13	-	-	-	-	1,499	-
Goodhue	631	-	-	-	-	-	-	-	-	-	631	-
Isanti	1,383	-	-	-	169	1,177	-	16	-	-	21	-
Kanabec	15,984	-	-	-	231	252	-	-	-	-	15,419	8
Mille Lacs	48,773	-	-	-	370	620	-	-	-	-	47,439	11
Morrison	13,912	-	314	-	384	479	-	93	-	-	12,219	5
Otter Tail	30,414	-	-	-	24	10	-	-	-	-	30,199	82
Pine	117,366	-	2,022	-	5,051	3,091	10	879	52	53	95,053	111
Rice	13	-	-	-	13	-	-	-	-	-	-	-
Sherburne	344	-	-	-	26	310	-	-	-	-	9	-
Stearns	144	-	-	-	-	116	-	-	-	-	28	-
Todd	6,171	-	-	-	48	32	-	-	-	-	6,080	1
Wabasha	541	-	-	-	82	329	25	-	-	-	105	-
Washington	1,284	-	-	-	-	1,149	60	66	-	-	10	2/
Winona	279	-	-	-	184	69	26	-	-	-	-	-
Total	241,754	-	2,335	-	6,582	10,196	120	1,190	52	61	208,964	219
Prairie												
Clay	3,229	-	-	-	-	-	-	-	-	-	3,229	-
Kittson	5,568	-	-	-	-	-	-	-	-	-	5,561	7
Marshall	11,422	-	-	-	-	-	-	-	-	-	10,941	481
Norman	3,081	-	-	-	-	-	-	-	-	-	3,081	-
Pennington	2,461	-	-	-	-	-	-	-	-	-	2,436	25
Polk	11,879	-	-	-	-	-	-	-	88	-	11,767	13
Red Lake	5,516	-	-	-	-	-	-	-	-	-	5,501	5
Total	43,157	-	-	-	-	-	-	-	88	-	42,516	531
State total	2,810,075	-	197,737	-	97,126	24,089	806	149,956	12,217	1,050	2,103,289	96,132

(Table 10 continued on next page)

(Table 10 continued)

Unit and county	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
Aspen-Birch												
Carlton	9	-	11,495	6	-	-	-	115	1,355	20	-	4
Cook	-	-	4,086	-	-	-	-	-	70	-	-	-
Koochiching	-	-	1,097	60	-	-	-	67	332	28	9	-
Lake	-	-	16,698	-	-	-	-	1,577	853	4	-	-
St Louis	-	-	30,023	1,399	-	-	-	682	4,089	-	-	-
Total	9	-	63,397	1,465	-	-	-	2,441	6,700	52	9	4
Northern Pine												
Aitkin	6	-	2,517	1,036	-	-	-	180	325	4	-	1
Becker	-	-	836	-	-	-	-	-	-	-	-	-
Beltrami	-	-	6,368	35	-	-	-	-	149	-	-	-
Cass	-	-	4,015	2,445	-	-	-	-	551	-	-	-
Clearwater	-	-	1,691	-	-	-	-	-	-	-	-	-
Crow Wing	-	-	195	571	-	-	-	-	-	-	-	-
Hubbard	-	-	4,603	36	-	-	-	-	233	109	-	-
Itasca	6	-	7,813	5,653	-	-	-	180	1,886	4	-	1
Lake of the Woods	-	-	49	2	-	-	-	-	-	-	-	-
Mahnomen	-	-	10	-	-	-	-	-	-	-	-	-
Roseau	-	-	3	-	-	-	-	-	-	-	-	-
Wadena	-	-	21	-	-	-	-	-	-	-	-	-
Total	13	-	28,122	9,779	-	-	-	360	3,144	117	-	2
Central Hardwood												
Anoka	-	-	-	-	-	-	-	-	-	-	-	-
Benton	-	-	-	-	-	-	-	-	-	-	-	-
Chisago	3	-	14	-	-	-	-	14	6	16	-	3
Douglas	-	-	-	-	-	-	-	-	-	-	-	-
Goodhue	-	-	-	-	-	-	-	-	-	-	-	-
Isanti	-	-	-	-	-	-	-	-	-	-	-	-
Kanabec	-	-	36	38	-	-	-	-	-	-	-	-
Mille Lacs	-	-	179	32	-	-	-	-	121	-	-	-
Morrison	-	-	390	-	-	-	-	28	-	-	-	-
Otter Tail	-	-	99	-	-	-	-	-	-	-	-	-
Pine	3	-	7,091	9	-	-	-	300	3,622	16	-	3
Rice	-	-	-	-	-	-	-	-	-	-	-	-
Sherburne	-	-	-	-	-	-	-	-	-	-	-	-
Stearns	-	-	-	-	-	-	-	-	-	-	-	-
Todd	-	-	10	-	-	-	-	-	-	-	-	-
Wabasha	-	-	-	-	-	-	-	-	-	-	-	-
Washington	-	-	-	-	-	-	-	-	-	-	-	-
Winona	-	-	-	-	-	-	-	-	-	-	-	-
Total	6	-	7,819	80	-	-	-	342	3,750	32	-	6
Prairie												
Clay	-	-	-	-	-	-	-	-	-	-	-	-
Kittson	-	-	-	-	-	-	-	-	-	-	-	-
Marshall	-	-	-	-	-	-	-	-	-	-	-	-
Norman	-	-	-	-	-	-	-	-	-	-	-	-
Pennington	-	-	-	-	-	-	-	-	-	-	-	-
Polk	-	-	12	-	-	-	-	-	-	-	-	-
Red Lake	-	-	10	-	-	-	-	-	-	-	-	-
Total	-	-	22	-	-	-	-	-	-	-	-	-
State total	28	-	99,361	11,324	-	-	-	3,144	13,594	202	9	12

Table 11.--Pulpwood production from roundwood by county and species group, Wisconsin, 1995

(In standard cords, unpeeled)

Unit and county 1/	All species	Species group										Balsam poplar
		N. white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	
Northeastern												
Florence	60,608	18	3,340	615	3,113	3,997	157	1,361	154	992	20,838	451
Forest	125,168	--	4,316	5,568	492	5,067	281	2,943	370	4,994	45,607	884
Langlade	145,894	--	5,167	1,999	1,951	3,632	515	1,894	486	5,621	58,275	258
Lincoln	114,164	--	2,873	575	2,557	4,609	725	1,100	236	4,030	55,369	104
Marinette	117,990	1	3,885	541	13,811	15,126	1,221	1,265	587	1,180	44,536	597
Menominee	74,377	211	3,111	12,080	5,485	3,544	1,441	716	268	1,861	24,937	182
Oconto	70,756	--	267	149	8,182	6,216	308	159	134	793	33,191	189
Oneida	124,479	--	3,873	345	4,525	7,891	1,995	4,285	847	4,450	41,201	468
Shawano	31,062	--	61	1,172	85	4,014	189	48	70	651	18,209	2
Vilas	155,411	--	3,147	124	22,638	6,156	1,718	1,739	568	3,310	54,457	375
Total	1,019,908	230	30,040	23,167	62,839	60,254	8,549	15,509	3,721	27,883	396,620	3,510
Northwestern												
Ashland	81,276	--	3,101	76	726	2,878	503	3,552	701	3,275	33,819	22
Barron	24,031	--	43	14	435	565	27	60	--	967	15,563	2
Bayfield	189,822	--	5,263	41	41,028	4,706	1,049	2,116	40	3,189	89,439	144
Burnett	71,483	--	125	--	24,788	6,955	211	92	7	556	32,130	1
Douglas	197,474	--	13,144	--	58,894	15,075	309	2,340	194	1,392	72,052	25
Iron	162,413	--	3,483	316	736	989	858	2,723	141	4,714	87,820	176
Polk	44,479	--	14	14	15,293	1,713	25	13	--	294	23,352	1
Price	136,349	--	7,474	757	1,288	3,555	453	3,374	948	4,675	64,528	127
Rusk	88,579	--	169	67	438	1,024	290	294	336	4,075	42,510	62
Sawyer	166,152	--	5,206	278	3,823	7,375	1,377	3,700	523	6,427	66,827	25
Taylor	75,333	--	2,313	1,740	55	793	81	596	827	2,866	37,547	46
Washburn	96,953	--	904	24	17,022	11,600	691	540	95	1,145	48,076	8
Total	1,334,346	--	41,239	3,325	164,525	57,228	5,873	19,399	3,812	33,575	613,664	638
Central												
Adams	77,551	--	30	--	35,547	17,423	2,353	4	--	238	5,434	3
Chippewa	33,495	--	32	41	289	1,418	210	31	--	1,011	19,788	10
Clark	100,350	--	25	32	2,701	1,376	406	1	--	3,280	53,325	65
Eau Claire	39,297	--	--	--	6,167	5,757	595	10	--	1,295	10,189	2
Jackson	90,056	--	30	25	42,037	9,918	2,473	29	34	1,450	13,160	1
Juneau	64,399	--	--	3	32,842	9,260	2,234	5	93	583	2,401	1
Marathon	71,406	--	677	834	602	5,897	678	1,162	30	3,008	31,582	26
Marquette	12,500	--	6	--	995	8,565	811	--	56	71	355	--
Monroe	32,480	--	--	--	12,535	5,214	1,530	19	--	670	3,119	3
Portage	38,004	--	50	188	8,854	11,301	1,545	146	248	462	8,706	15
Waupaca	17,540	--	49	125	360	5,490	504	693	51	281	7,190	51
Waushara	32,492	--	--	--	1,807	24,200	2,158	271	187	211	1,055	--
Wood	51,534	--	--	40	10,234	6,877	1,895	509	--	781	22,923	3
Total	661,102	--	900	1,287	154,971	112,695	17,393	2,880	699	13,340	179,228	180
Southwestern												
Buffalo	6,916	--	1	--	--	2,101	263	14	--	185	3,358	--
Crawford	190	--	--	--	--	13	--	--	--	5	--	--
Dunn	17,219	--	--	--	788	6,549	215	111	--	404	5,314	1
Grant	4,125	--	--	13	132	3,420	399	--	--	13	36	--
Iowa	1,310	--	--	--	14	813	239	164	--	1	69	--
La Crosse	3,804	--	--	--	1,460	1,300	248	153	--	19	425	--
Lafayette	57	--	--	--	--	13	--	--	--	2	--	--
Pepin	584	--	--	--	--	--	79	45	--	8	390	--
Pierce	943	--	18	--	68	431	68	10	--	20	167	--
Richland	661	--	--	--	155	113	87	--	--	14	--	--
Sauk	9,530	--	--	--	461	4,094	946	259	--	184	429	--
St Croix	9,970	--	--	--	2,924	2,028	73	407	--	48	3,436	--
Trempealeau	9,182	--	45	--	36	3,573	326	342	--	187	2,885	1
Vernon	408	--	16	--	--	50	--	--	--	11	14	--
Total	64,899	--	79	13	6,039	24,497	2,943	1,506	--	1,101	16,523	2
Southeastern												
Brown	7,067	--	--	--	--	897	--	--	--	9	5,251	600
Calumet	65	--	--	--	23	--	--	--	--	--	42	--
Columbia	4,510	--	--	--	82	2,847	399	11	--	44	133	--
Dane	389	--	10	--	7	11	--	--	--	39	26	--
Dodge	194	--	--	--	--	53	113	--	--	--	28	--
Door	2,289	--	11	--	--	--	17	--	13	16	442	--
Fond Du Lac	527	--	--	--	30	102	36	--	--	7	228	--
Green	57	--	13	--	--	--	--	--	--	4	--	--
Green Lake	1,344	--	--	--	46	691	21	--	--	49	32	--
Jefferson	6,643	--	1,033	243	1,314	2,766	1,205	41	14	--	28	--
Kenosha	755	--	--	--	--	409	208	125	--	--	13	--
Kewaunee	324	--	16	23	--	--	--	--	--	30	14	--
Manitowoc	35	--	--	--	--	11	--	--	--	3	--	--
Milwaukee	19	--	--	--	19	--	--	--	--	--	--	--
Outagamie	4,902	--	--	--	25	522	--	33	24	243	1,929	--
Ozaukee	77	--	--	--	--	--	16	61	--	--	--	--
Rock	28	--	13	--	16	--	--	--	--	--	--	--
Sheboygan	2,767	--	16	--	--	1,820	795	99	--	3	10	--
Walworth	893	--	--	--	304	285	303	--	--	--	--	--
Washington	932	--	--	--	--	361	381	176	14	--	--	--
Waukesha	823	--	--	--	24	403	364	--	--	2	11	--
Winnebago	50	--	--	--	--	--	--	--	--	1	15	--
Total	34,690	--	1,111	266	1,890	11,180	3,857	547	64	451	8,202	600
State total	3,114,945	230	73,370	28,058	390,264	265,854	38,615	39,841	8,295	76,349	1,214,236	4,930

1/ Includes only those counties that supplied pulpwood in 1995.

(Table 11 continued on next page)

(Table 11 continued)

Unit and county 1/	WISCONSIN											
	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
Northeastern												
Florence	1,364	12	3,668	975	18	381	--	11,455	6,515	825	169	189
Forest	2,322	156	10,324	1,894	46	4,479	--	18,017	13,489	2,700	861	360
Langlade	3,012	44	21,283	1,879	71	1,538	--	20,622	13,065	2,923	1,220	438
Lincoln	3,883	50	13,156	769	105	1,569	--	9,866	6,877	4,440	511	760
Marinette	1,212	3	10,604	1,095	9	58	--	12,905	7,521	1,306	318	207
Menominee	349	218	1,157	964	3	2,449	--	7,788	6,628	700	60	225
Oconto	1,043	12	5,760	670	16	386	--	7,829	4,549	649	101	151
Oneida	4,834	7	21,305	796	127	343	--	12,512	7,844	5,168	814	849
Shawano	110	26	575	300	2	790	--	2,306	2,016	272	150	13
Vilas	6,072	7	25,094	1,008	170	317	--	14,093	8,586	4,406	735	691
Total	24,202	535	112,925	10,350	567	12,312	--	117,394	77,089	23,390	4,940	3,883
Northwestern												
Ashland	903	6	11,529	748	13	341	--	8,870	6,874	2,229	858	252
Barron	178	--	1,876	99	1	20	--	1,860	1,506	544	111	159
Bayfield	1,868	2	19,600	832	37	146	--	7,682	6,519	4,269	1,090	257
Burnett	131	--	1,900	71	1	16	--	1,006	2,578	672	199	46
Douglas	130	--	21,898	205	--	31	--	2,114	9,127	338	188	20
Iron	6,601	11	14,523	1,378	175	494	--	18,870	11,865	4,833	882	825
Polk	146	--	946	31	2	7	--	647	771	910	261	40
Price	4,591	25	16,292	975	127	868	--	12,135	7,962	4,659	655	881
Rusk	2,896	21	11,996	899	256	923	--	10,523	7,634	3,019	627	519
Sawyer	1,821	10	28,323	2,038	24	555	--	18,272	14,213	3,383	1,522	430
Taylor	1,781	61	7,889	843	80	1,947	--	7,590	5,522	1,987	485	282
Washburn	583	--	6,887	198	7	33	--	2,942	4,944	951	144	160
Total	21,629	136	143,659	8,317	723	5,382	--	92,512	79,515	27,793	7,023	3,873
Central												
Adams	153	--	439	10	3	2	--	387	460	12,822	2,014	227
Chippewa	770	3	2,780	169	117	230	--	2,555	2,129	1,421	336	156
Clark	2,301	24	8,357	863	82	853	--	9,457	6,333	7,999	2,633	240
Eau Claire	290	5	2,866	181	1	179	--	2,855	2,139	5,160	1,399	205
Jackson	320	--	3,491	150	2	33	--	2,565	3,588	8,101	1,777	871
Juneau	144	--	1,037	26	1	6	--	1,252	1,025	11,332	2,048	105
Marathon	1,029	161	2,958	1,046	26	4,877	--	7,462	6,556	2,135	433	225
Marquette	40	--	125	2	1	6	--	132	73	1,031	203	26
Monroe	230	--	1,037	23	3	5	--	1,501	808	4,766	869	148
Portage	461	15	540	128	14	463	--	1,069	1,353	1,919	482	46
Waupaca	271	15	213	91	8	449	--	700	615	302	48	35
Waushara	51	--	224	15	1	6	--	267	313	1,472	209	46
Wood	118	--	1,238	192	2	23	--	1,943	1,304	2,762	650	40
Total	6,177	223	25,303	2,897	260	7,133	--	32,145	26,696	61,223	13,101	2,371
Southwestern												
Buffalo	71	--	389	16	1	4	--	392	254	274	24	78
Crawford	1	--	13	2	--	--	--	19	11	99	27	--
Dunn	136	--	1,283	53	1	11	--	861	934	420	71	66
Grant	1	--	22	4	--	--	--	40	32	9	4	--
Iowa	--	--	3	--	--	--	--	4	3	1	--	--
La Crosse	9	--	36	1	--	--	--	37	62	35	5	14
Lafayette	--	--	6	1	--	--	--	7	5	17	6	--
Pepin	3	--	15	1	--	--	--	20	13	7	1	1
Pierce	7	--	42	2	--	--	--	45	25	32	2	6
Richland	3	--	16	--	--	--	--	35	14	185	36	3
Sauk	64	--	372	18	1	4	--	443	312	1,569	319	54
St Croix	79	--	357	13	--	2	--	136	424	27	15	2
Trempealeau	105	--	363	4	1	1	--	356	215	588	83	69
Vernon	6	--	20	2	--	--	--	32	20	181	52	4
Total	487	--	2,938	117	4	23	--	2,425	2,325	3,443	645	297
Southeastern												
Brown	61	2	24	4	--	2	--	53	153	6	1	3
Calumet	--	--	--	--	--	--	--	--	--	--	--	--
Columbia	15	--	86	4	--	1	--	101	54	553	168	11
Dane	27	--	68	--	1	--	--	71	32	80	--	16
Dodge	--	--	--	--	--	--	--	--	--	--	--	--
Door	16	--	1,546	8	--	--	--	121	65	26	--	6
Fond Du Lac	1	--	18	2	--	--	--	20	14	51	18	--
Green	2	--	7	--	--	--	--	7	3	18	1	2
Green Lake	11	--	97	6	--	1	--	108	73	162	37	10
Jefferson	--	--	--	--	--	--	--	--	--	--	--	--
Kenosha	--	--	--	--	--	--	--	--	--	--	--	--
Kewaunee	--	--	24	13	--	--	--	102	100	2	1	--
Manitowoc	--	--	1	1	--	--	--	9	9	--	--	--
Milwaukee	--	--	--	--	--	--	--	--	--	--	--	--
Outagamie	18	1	206	94	--	29	--	795	754	198	23	8
Ozaukee	--	--	--	--	--	--	--	--	--	--	--	--
Rock	--	--	--	--	--	--	--	--	--	--	--	--
Sheboygan	5	--	5	--	--	--	--	5	3	6	--	1
Walworth	--	--	--	--	--	--	--	--	--	--	--	--
Washington	--	--	--	--	--	--	--	--	--	--	--	--
Waukesha	--	--	9	--	--	--	--	6	4	--	--	--
Winnebago	--	--	3	--	--	--	--	4	2	19	6	--
Total	157	3	2,094	132	1	33	--	1,401	1,266	1,121	255	57
State total	52,651	897	286,919	21,813	1,555	24,883	--	245,877	186,891	116,971	25,965	10,482

Table 12.--Central States pulpwood production by State and destination, 1991-1995

(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
1991	81	37	44	157	56	101	14	14	--	87	17	70
1992	77	33	44	150	49	101	12	12	--	116	22	94
1993	55	25	30	143	47	96	13	13	--	78	13	65
1994	76	33	43	147	51	96	22	22	(1/)	88	19	69
1995	81	33	48	310	212	98	23	22	2	113	12	101

1/ Less than 500 standard cords.

Table 13.--Trends in receipts of roundwood and residue as pulpwood,
Central States, 1991-1995

(In thousand standard cords, unpeeled)

Type of material and State	1991	1992	1993	1994	1995
Roundwood					
Indiana, Iowa, Missouri	44	33	28	42	54
Residue					
Indiana, Iowa, Missouri	85	83	71	86	243
All material	129	116	99	127	297

Piva, Ronald J.

1996. **Pulpwood production in the North-Central Region, 1995.**

Resour. Bull. NC-180. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 39 p.

Lake States pulpwood production decreased 2 percent—from 9.7 million cords in 1994 to 9.6 million cords in 1995. Central States pulpwood production increased 59 percent—from 333 thousand cords in 1994 to 528 thousand cords in 1995. Plains States pulpwood production was 115 thousand cords in 1995, an increase of 4 percent from 1994. Pulpwood production is shown by county and species group for Michigan, Minnesota, and Wisconsin.

KEY WORDS: Roundwood, whole-tree chips, residue, pulpwood, particleboard, Minnesota, Michigan, Wisconsin, Illinois, Iowa, Indiana, Missouri, Plains States.