More Pallet Companies Enter Recycling to Cut Expenses

New Study Shows U.S. Wood Pallet Industry Remains Highly Competitive—Part I

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(Editor's Note: The following report is the fifth in a continuing series of research surveys of the U.S. wood pallet industry supported in part by the U.S. Forest Service and the Illinois Wood Products Association. The survey was conducted by the authors, Jean C. Mangun and John E. Phelps. Both are on the faculty of the Southern Illinois University-Carbondale forestry department; Jean is an associate professor and John is a professor and department chair. Their complete report will be published in two parts with part two to be included in the April issue. This Part 1 includes a presentation of the sampling practices, the number and distribution of companies manufacturing and recycling pallets, and the number of pallets produced by each respondent. Part 2 includes pallet types and sizes, pallet markets and raw materials, wood residue, etc. A more detailed description of the sampling techniques and statistical methods is available from the authors, who may be reached at (618) 453-3341.)

Introduction

The wood pallet industry is widely recognized as one of the major forest products industries in the U. S. The industry not only represents the largest single user of domestic hardwood lumber, it also comprises the major U.S. market for low grade lumber (5, 10, 11, 13, 15).

Although the wood pallet industry experienced unprecedented growth in the 50 years after the close of WW II, new challenges are on the horizon (3, 5, 13, 15, 18). For example, the increasing market share of substitute, non-wood pallet materials for grocery distribution has become an area of concern (15). In addition, the price of landfilling pallet residues has increased dramatically in recent years (6). The continued ability of wood pallet manufacturers to adapt to changing market conditions, therefore, is essential. Recycling has become a significant component of the wood pallet industry, and this activity is predicted to increase (2, 5, 17). Recent research on industry trends found that as the number of pallets reaching landfills has decreased, the number of pallets recovered at landfills has increased (1). Forty-four percent of U.S. wood pallet firms were involved with some aspect of reuse and recycling as early as 1992 (4, 17).

It is important periodically to update a marketing profile of the U.S. wood pallet industry. New information is needed on the type and percent of non-wood substitutes being used in pallet manufacture, number of firms that recondition pallets, and changes that may have occurred in the various user groups purchasing pallets. Furthermore, a need exists to examine regional differences in today's pallet industry. This study presents the results of a continuing effort to document the raw materials, products, and markets of the dynamic U.S. wood pallet industry.

Survey Series Methodology

In 1980, 1985, 1990, and 1995, the Department of Forestry at Southern Illinois University Carbondale (SIUC) sent surveys all known pallet firms in the United States (9, 10). The 1980 to 1995 surveys used similar methodologies, and published information for these four surveys is directly comparable. For the 1995 survey, addresses of pallet firms were obtained from a Dun & Bradstreet list, a Harris list, and from individual state directories. There were 3,793 firms in the 1995 target population. Seven hundred eighteen questionnaires were returned for an overall response rate of 18.9%. Three hundred seventy responding firms either declined to participate or reported not producing pallets in 1995, thereby reducing the usable response rate to 9.2% (10).

In the summer of 2001, our fifth industry mail survey was sent to a representative sample of U.S. pallet firms. The questionnaire addressed wood use, markets, and other business practices during calendar year 2000. The sample frame for the study consisted of manufacturing firms classified by Standard Industrial Classification (SIC) code 2448, wood pallets and skids (12). An interactive CD-ROM database listing 3,031 U.S. pallet firms was purchased from InfoUSA, Inc. (8). A stratified random sample was selected from this database using the nine Census Regions of the U.S. Bureau of Census (Fig. 1) as strata. The sample was designed to be statistically reliable at the regional level, not for individual states.

This survey procedure consisted of a personalized, advanced-notice letter, an initial cover letter and survey mailing, a thank you/reminder postcard mailing, and a second cover letter and survey mailing. Telephone contacts with nonrespondents were made on a limited basis.

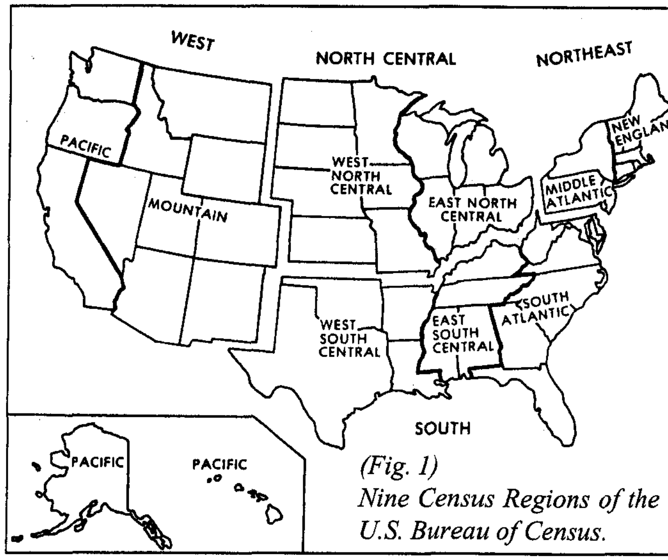
Of the 958 surveys mailed, 146 were undeliverable or no longer in business, reducing the sample to 812. The overall study response rate was 25% (203/812). Of the 203 returned surveys, 50 were from firms that either declined to participate or indicated not being involved directly in pallet manufacturing or reconditioning in 2000 (e.g., container manufacturers, pallet brokers, materials handling firms, going out of business, etc.). The balance of returned surveys was usable, for an adjusted study response rate of 18.8% (153/812).

The randomized sampling methodology of the 2001 survey differs significantly from the previous total census mailings, so its estimates are not directly comparable to the four earlier surveys. Although selected results from the entire survey series will be presented in tabular form, rigorous trend analysis is not possible. Any comparison of 2000 estimates with those of the 1980 to 1995 surveys requires careful consideration of distributions, standard errors and confidence intervals.

In the discussion of the findings, the 2000 data are generally presented first. Where applicable, a tabular comparison of distributions was made with the 1980, 1985, 1990, and 1995 survey findings. Tables that were presented in substantially the same format as those in previous SIUC survey reports were identified with an asterisk (*).

Distribution of Firms

The number of pallet firms identified in each SIUC survey's sample frame has been listed by state (Table 1). California and Ohio again had the largest number of firms, each with more than 200 firms identified in the database used by the 2001 survey (8). More than 25 % of year 2000 firms were located in the East North Central Census Region (Table 1, Fig. 1).



(Fig. 1)
Nine Census Regions of the U.S. Bureau of Census.

Overall Pallet Production

Approximately 44% of responding firms (n = 153) engaged solely in new pallet production during 2000. Forty-seven percent reconditioned used pallets in addition to producing new pallets. With the addition of responding firms that reported a business based solely upon reconditioning used pallets (Fig. 2),

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Figure 2. Type of Production

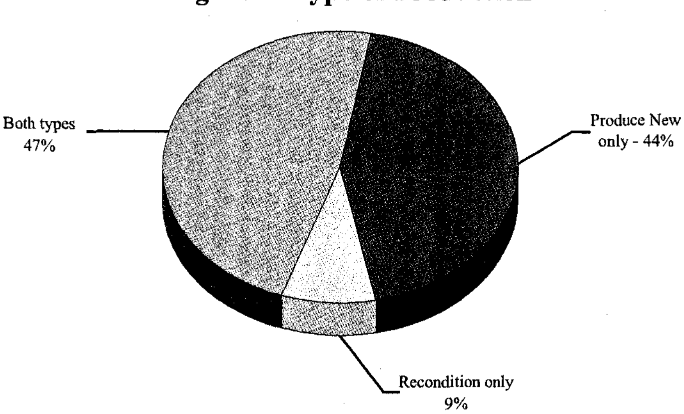

Table 1.* Distribution of pallet firms by state 1980, 1985, 1990, 1995, and 2000.

State	1980	1985	1990	1995	2000
Alabama	38	47	76	75	70
Alaska	--	--	2	1	2
Arizona	8	8	25	40	35
Arkansas	45	43	84	67	54
California	123	111	143	324	210
Colorado	16	15	38	32	33
Connecticut	26	33	35	29	17
Delaware	7	5	3	4	5
Florida	29	32	38	80	77
Georgia	73	78	112	109	117
Hawaii	1	3	4	5	2
Idaho	9	8	10	15	16
Illinois	106	83	184	144	144
Indiana	132	135	132	120	137
Iowa	22	19	42	45	79
Kansas	24	16	27	33	38
Kentucky	97	107	107	91	78
Louisiana	29	23	23	31	26
Maine	20	28	10	28	17
Maryland	28	18	23	35	27
Massachusetts	35	53	63	67	44
Michigan	224	194	298	206	169
Minnesota	43	36	71	69	74
Mississippi	40	27	49	46	53
Missouri	110	93	147	120	133
Montana	6	5	6	12	8
Nebraska	11	13	30	23	29
Nevada	2	2	4	6	10
New Hampshire	21	24	13	30	16
New Jersey	63	54	65	67	57
New Mexico	2	1	7	9	7
New York	106	89	168	139	76
North Carolina	66	60	90	132	99
North Dakota	1	2	3	3	3
Ohio	228	187	197	319	201
Oklahoma	26	20	29	30	26
Oregon	26	36	24	71	33
Pennsylvania	185	151	251	272	188
Rhode Island	8	11	11	22	9
South Carolina	35	35	55	61	46
South Dakota	3	2	7	6	14
Tennessee	65	86	89	143	120
Texas	103	90	145	203	145

Figure 3. Distribution of New Pallet Production

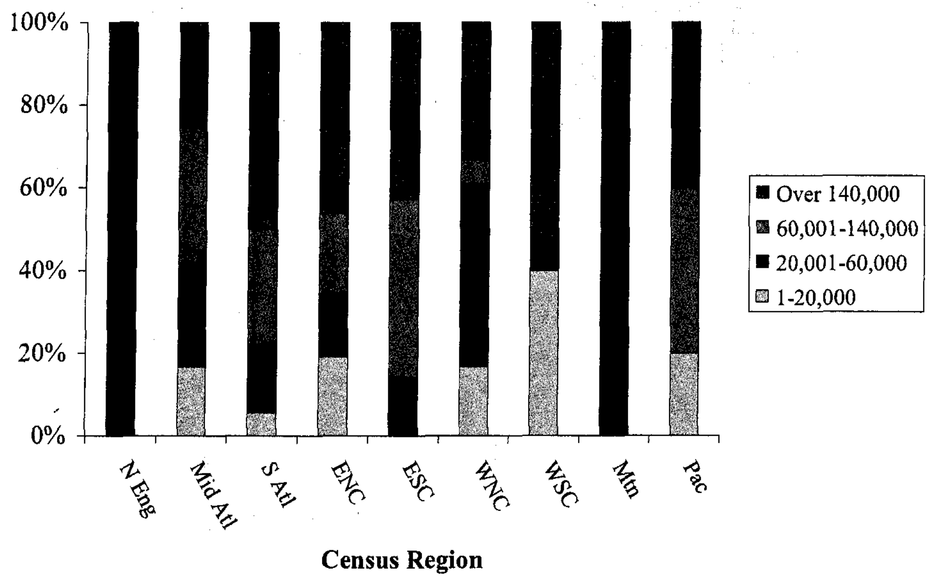

Table 2. Pallet Firm Summary Data by Bureau of Census Region, 2000.

Census Region	Percent of Sampled	Percent of Returned	Mean New Production	Mean Reconditioned	Mean No. Employees[a]	Percent Pallets Single-use[a]	Percent New Wood Hardwood[a]	Wood per Avg. Pallet (bd ft)[a]
1. New England	3.7 %	5.9 %	316,281	75,469	20.4	71.7 %	87.3 %	14.6
2. Mid-Atlantic	10.6 %	10.3 %	252,259	166,600	26.3	32.1 %	78.0 %	16.5
3. S. Atlantic	15.1 %	12.8 %	313,474	290,922	30.2	67.2 %	70.2 %	19.9
4. E. N. Central	25.7 %	23.6 %	170,833	178,070	14.5	41.5 %	83.3 %	13.7
5. E. S. Central	10.6 %	9.9 %	193,251	579,601	32.6	77.9 %	81.8 %	14.0
6. W. N. Central	12.2 %	16.7 %	117,110	42,269	12.2	55.9 %	64.9 %	19.1
7. W. S. Central	8.3 %	8.4 %	501,200	84,000	52.8	34.0 %	66.8 %	16.5
8. Mountain	4.4 %	5.4 %	184,375	137,237	22.0	35.5 %	11.6 %	22.2
9. Pacific	9.4 %	6.9 %	326,067	302,949	38.5	57.0 %	2.8 %	22.4

[a]Regions found to differ significantly, $p < 0.1$

Table 3.* Annual New Pallet Production 1980, 1985, 1990, 1995, and 2000.

Number of Pallets	1980	1985	1990	1995	2000 (n=123)
	Percent of Firms				
1 – 20,000	25	16	22	25	13.8
20, 001 – 60,000	25	21	15	17	25.2
60,001 – 140,000	24	24	23	17	20.3
Over 140,000	26	39	40	41	40.7
Total	100 %	100 %	100 %	100 %	100 %

Table 4.* Annual Used Pallets Reconditioned[1] 1990, 1995, and 2000.

Number of Pallets	1990	1995	2000 (n=76)
	Percent of Firms		
1 – 2,500	28	18	11.8
2,501 – 10,000	21	18	14.5
10,001 – 100,000	28	38	38.2
Over 100,000	23	26	35.5
Total	100 %	100 %	100 %

[1]Percent distribution refers only to those firms reconditioning pallets.

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we find that 56% of U.S. wood pallet firms engaged in some type of recycling activities during 2000. Analysis of type of pallet production category by Bureau of Census Region found no significant differences in the distribution of production categories (produce new, recondition only, both types) by Census region.

Annual New Pallet Production

The mean number of new pallets produced per firm engaged in this activity (n = 123) in calendar year 2000 was 233,216 units. More than 50% of responding firms made less than 100,000 pallets during 2000, resulting in a positively skewed distribution. The median number was 95,000 with a range of 500 to 1.95 million units. Only 5% of firms produced greater than 1 million new pallets each. In comparison with 1995, annual new pallet production per firm in 2000 appears to have remained relatively stable (1995: mean = 254,000; 2000: mean = 233,216, with a 95% confidence interval of the mean 168,549 to 297,882).

The 2000 mean annual new pallet production did not vary by Bureau of Census Region at a statistically significant level. The highest mean annual new pallet production in 2000 (501,200) occurred in the West South Central Region and the lowest (117,110) in the West North Central Region (Table 2).

Year 2000 new pallet data have been recoded into categories that allow qualified comparison with response distributions from previous SIUC survey reports (Table 3). Approximately 41% of responding firms reported producing more than 140,000 new pallets annually. Cross-classification analysis of new pallet production category by Bureau of Census Region did reveal a significant difference in the distribution of the four new pallet production categories by Census region. For example, no firms reporting 20,000 new units or less were located in the New England, East South Central, or Mountain Regions (Fig. 3).

Annual Used Pallets Reconditioned

The mean number of used pallets reconditioned per firm engaged in this activity (n = 76) in calendar year 2000 was 213,782 units. More than 60% of re-

Table 5.* Mean Daily Production and Capacity of Firms 1980, 1985, 1990, 1995, and 2000.

Number of Pallets	Mean Daily Production 1980	1985	1990	1995	2000 (*n*=153)	Capacity 1980	1985	1990	1995	2000 (*n*=153)
	Percent of Firms									
1 – 200	28	25	27	26	18.5	15	12	14	12	12.4
201 – 400	24	24	18	18	19.2	19	18	16	17	11.6
401 – 800	24	21	23	18	21.5	28	25	23	23	25.6
Over 800	24	30	32	38	40.8	38	45	47	48	50.4
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 6.* Number of Days Pallets Produced 1990, 1995, and 2000.

Days	1990	1995	2000 (*n*=76)
	Percent of Firms		
1 –100	7	9	2.4
101 – 250	58	59	54.3
Over 250	35	32	43.3
Total	100 %	100 %	100 %

sponding firms reconditioned less than 100,000 pallets during 2000, resulting in a positively skewed distribution. The median number was 55,000 with a range of 270 to 3.5 million units. Only 3% of firms reconditioned over 1 million pallets each. In comparison with 1995, the mean annual used pallets reconditioned per firm in 2000 appears to have increased (1995: mean = 131,000; 2000: mean = 213,782) Analysts are 95% confident that the mean number of reconditioned pallets lies between 105,376 and 322,188.

The 2000 mean annual used pallets reconditioned did not vary by Bureau of Census Region at a statistically significant level. The highest mean annual pallets reconditioned in 2000 (579,601) occurred in the East South Central Region and the lowest (42,269) in the West North Central Region (Table 2).

Year 2000 reconditioned data also have been recoded into categories that allow qualified comparison with response distributions from previous SIUC survey reports (Table 4). Approximately 36% of responding firms (n = 76) reported reconditioning more than 100,000 pallets annually. However, cross-classification analysis of reconditioned pallet category by Bureau of Census Region found no significant differences in the distribution of the four reconditioned pallet categories by Census region.

Daily Production Versus Capacity

Less than 3% of firms (n = 153) reported producing pallets fewer than 100 days during calendar year 2000. How-

Table 7.* Number of Employees 1980, 1985, 1990, 1995 and 2000.

Number of Employees	1980	1985	1990	1995	2000 (n=130)
	Percent of Firms				
1 – 5	29	18	25	27	19.2
6 – 10	23	26	24	22	24.6
11 – 20	24	27	25	18	25.4
Over 20	24	29	26	33	30.8
Total	100 %	100 %	100 %	100 %	100 %

ever, the U.S. wood pallet industry appears to have operated at approximately 58% of its production capacity. When firms were asked their current daily rate of production, the mean was 1,337 pallets per firm. On the other hand, the mean daily production capacity reported was 2,321 pallets. Firms produced pallets a mean number of 248 days in 2000. The mean number of hours in a typical work week was 42.5 hrs.

When compared on the basis of mean daily rate, mean capacity, and mean number of days, no significant differences were found among the nine Bureau of Census Regions. Likewise, no significant differences were found among Census regions when compared on the basis of daily rate, capacity, and number of days categories. Year 2000 daily rate, capacity, and number of days data have been recoded into categories that allow qualified comparison with distributions from previous SIUC survey reports (Tables 5 and 6).

Number of Employees

The mean number of pallet firm employees in calendar year 2000 was 24 people. Approximately 20% of reporting firms (n = 131) had five or fewer employees. The median number was 14 with a range of 1 to 253 employees.

The 2000 mean number of pallet firm employees did vary by Bureau of Census Region at a statistically significant level. The highest mean number of employees in 2000 (53 people) occurred in the West South Central Region and the lowest (12 people) in the West North Central Region (Table 2).

Year 2000 employee data have been recoded into categories that allow qualified comparison with response distributions from previous SIUC survey reports (Table 7). Approximately 31% of responding firms reported employing more than 21 individuals. However, cross-classification analysis of number of employees category by Bureau of Census Region found no significant differences in the distribution of the four number-of-employees categories by Census region.

Experience and Organizational Membership

The mean number of years in business reported (n = 128) was 24 years. The median number was 22 with a range of three to 63 years. When compared on the basis of mean years in business, no significant differences were found among the nine Census regions. When asked about current membership in the National Wooden Pallet and Container Association, only 26.5% of respondents (n = 132) answered in the affirmative. No association was found between years in business and organizational membership.

Summary

In the summer of 2001, a self-administered mail survey was sent to a stratified random sample of U.S. wood pallet firms. The sample was drawn from a listing of 3,031 U.S. pallet firms classified by Standard Industrial Classification (SIC) code 2448, wood pallets and skids (12), and identified on an interactive CD-ROM database purchased from InfoUSA, Inc. (8).

The U.S. wood pallet industry remained a highly competitive arena. Nineteen percent of respondents to the 2001 survey took the opportunity to write-in additional comments. Twenty-eight percent of this subgroup wrote of difficult economic times, indicating that they were either abandoning pallet manufacturing, going out of business altogether, or had experienced an unprofitable second half during 2000. Ten percent of commentors requested a simpler questionnaire form, and an additional 10% requested that more questions be included on recycling practices.

The following items of importance were found for calendar year 2000:

1. The U.S. wood pallet industry operated at approximately 58% of its production capacity during 2000.
2. Fifty-six percent of firms engaged in some type of recycling or reconditioning of used pallets. Approximately 9% of firms reported a business based solely upon pallet reconditioning.
3. The mean number of employees was 24 people.

(Editor's note: Part 2 to be published in April issue of Pallet Enterprise. Literature cited for Part 1 appears on page 83.)