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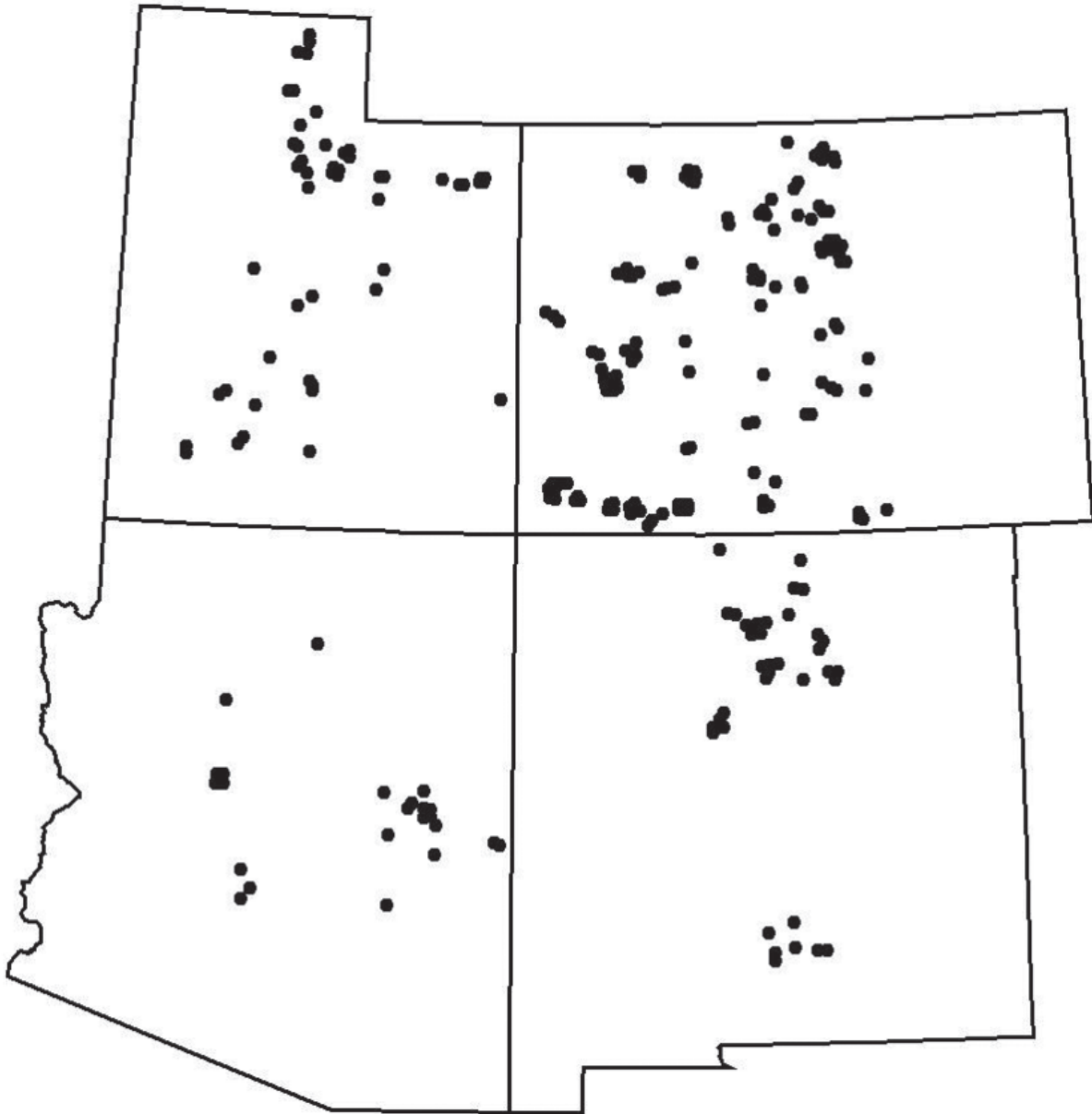
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The Four Corners Timber Harvest and Forest Products Industry, 2002

**Todd A. Morgan, Thale Dillon, Charles E. Keegan, III,
Alfred L. Chase, and Mike T. Thompson**



Abstract

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This report traces the flow of timber harvested in the "Four Corners" States (Arizona, Colorado, New Mexico, and Utah) during calendar year 2002, describes the composition and operations of the region's primary forest products industry, and quantifies volumes and uses of wood fiber. Historical wood products industry changes are discussed, as well as trends in timber harvest, production, and sales of primary wood products.

Keywords: forest economics, lumber production, mill residue, primary forest products, timber products

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Report Highlights

- During calendar year 2002, more than 323.5 MMBF of timber was harvested from Arizona, Colorado, New Mexico, and Utah. Most (72.6 percent) of the harvested volume came from tribal and nonindustrial private timberlands, while 26.1 percent came from National Forests. Ponderosa pine was the leading species harvested for timber in the Four Corners States during 2002, accounting for 57.8 percent of the total. Spruces accounted for 14.5 percent, followed by Douglas-fir and lodgepole pine at 9.3 and 6.7 percent, respectively.
- During 2002, the Four Corners were net exporters of timber, with 20 percent (66.1 MMBF) of the regional harvest exported for processing in other States. Mills in the Four Corners imported a total of 2.5 MMBF during 2002, while total receipts by Four Corners mills were slightly less than 260.0 MMBF.
- Timber-processing capacity (i.e., the volume of timber that could be used by existing timber processors if demand for products were firm and sufficient raw material were available) in the Four Corners during 2002 was approximately 450 MMBF, Scribner. Thus, approximately 58 percent of timber-processing capacity in the region was utilized in 2002.
- This report identified 241 primary timber processing facilities active during 2002 in the Four Corners. These facilities included 105 sawmills, 67 log home or house log manufacturers, 38 log furniture producers, 14 post and pole facilities, 10 viga and latilla producers, and seven other facilities.
- During 2002, production of lumber and other sawn products exceeded 274 MMBF, lumber tally. Lumber production in Arizona, Colorado, and New Mexico was about 82 MMBF for each State; Utah's lumber production was about 27 MMBF.
- Four Corners timber processors produced 305,190 BDU of residue during 2002, of which just 10,827 BDU (4 percent) went unused. Sawmills generated 279,060 BDU—91 percent of all mill residues in the region.
- The Four Corners primary wood product sales value (f.o.b. the producing mill), including mill residues, totaled nearly \$222 million during 2002. Almost \$142 million (64 percent) of sales were within the Four Corners States, and slightly more than half (\$114 million) of all sales were lumber and other sawn products.

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The Four Corners Timber Harvest and Forest Products Industry, 2002

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Introduction

This report details timber harvest and describes the composition and operations of the primary forest products industry in the “Four Corners” States (i.e., Arizona, Colorado, New Mexico, and Utah) during calendar year 2002. The report focuses on trends and changes in timber harvest levels in the forest products industry since the 1990s. For historical perspective, some discussion is offered of industry changes throughout the last half of the 20th century.

Timber used in the direct manufacture of products is the focus of this report. Products directly manufactured from timber are referred to as “primary products” and include lumber, posts and poles, house logs, log furniture, vigas and latillas. Reconstituted products made from chipping or grinding timber, as well as products from mill residue (i.e., bark, sawdust, log ends, chips, and planer shavings) generated in the production of primary products, are also included. These reconstituted primary products include excelsior, wood pellets, bark products, and fuelwood. Derivative, or “secondary” products (e.g., window frames, doors, trusses, and furniture) made from primary products are not included in this report.

The major source of data for this report was a census of primary forest products facilities in Arizona, Colorado, New Mexico, and Utah and mills in adjacent States that received timber from the Four Corners States during calendar year 2002. Firms were identified through telephone directories, directories of the forest products industries (Miller Freeman, Inc. 1999; Paperloop 2003; Random Lengths 2003), and with the assistance of State forestry agencies and the mills themselves. Firms cooperating in the Four Corners census, including out-of-State mills, processed virtually all of the commercial timber harvested from Arizona, Colorado, New Mexico, and Utah in 2002.

This report is the direct result of a cooperative effort between The University of Montana’s Bureau of Business and Economic Research (BBER) and the USDA Forest Service, Interior West Forest Inventory and Analysis (IW-FIA) Program. Together, BBER and Forest Service research stations have been conducting periodic mill censuses in the Rocky Mountains for over 25 years. The Forest Industries Data Collection System (FIDACS) was developed by BBER and IW-FIA to collect, compile, and make available State- and county-level information on the operations of the forest products industry and the timber it uses. The FIDACS uses a written questionnaire or phone interview of forest products manufacturers to collect the following information for each facility for a given calendar year: production capacity and employment; volume of raw material received by county and ownership; species of timber received; finished product volumes, types, sales values, and market locations; and utilization and marketing of manufacturing residue. Information collected through the FIDACS is

processed, analyzed, and stored at the BBER in Missoula, Montana. Additional information is available by request; however, individual firm-level data are confidential and will not be released.

Four Corners Regional Summary

This chapter discusses the Four Corners as a whole, providing an historical overview, as well as information on the forest products industry and timber harvest in 2002. It presents ownership and species composition of harvested timber, types of timber products harvested and processed, as well as movement of timber within the Four Corners and between the region and other States. Timber-processing and production capacities, utilization of mill residues, and forest products sales and employment are also discussed at the regional level.

Historic Overview

Following World War II, with strong housing markets and public policy encouraging timber production on National Forests, timber harvest for industrial products in the Four Corners States increased from about 700 million board feet (MMBF, Scribner log scale) annually during the early 1950s to a peak of approximately 1,000 MMBF in the late 1960s. During the 1970s and 1980s, harvest volumes dropped somewhat with harvest during the late 1980s averaging about 850 MMBF annually. Timber harvest from the region declined dramatically during the 1990s, caused largely by decreases in the harvest from National Forests. National Forest timber harvests in Arizona, Colorado, New Mexico, and Utah followed the course of most Western States, declining due to threatened and endangered species, appeals and litigation directed at Federal timber sales, and Federal budget levels.

In Arizona and New Mexico, the listing of the Mexican spotted owl had a profound downward impact on National Forest timber harvest levels. The Mexican spotted owl was listed as threatened by the United States Fish and Wildlife Service in March of 1993. In August of 1995, a Federal judge enjoined the logging of new timber sales on National Forests in Arizona and New Mexico pending development of a recovery plan for the owl (*Silver and others v. Thomas and others* 1995). Between 1990 and 1996, harvest from Arizona National Forests dropped from 300 MMBF annually to about 28 MMBF, and harvest from New Mexico National Forests fell from about 125 MMBF to less than 20 MMBF annually. Most of the material harvested during the period was for fuelwood, not industrial timber products. The lifting of the injunction in December 1996 resulted in increases in National Forest timber offerings in 1997 and 1998. The cut from Arizona National Forests increased to about 61 MMBF in 1997 and 63 MMBF in 1998; the cut from New Mexico National Forests increased slightly to 23 MMBF in 1997 and 30 MMBF in 1998.

Declines in National Forest timber offerings have negatively impacted both Colorado's and Utah's industry as well, leading to substantially lower total harvest. Though not as sharp nor abrupt as in Arizona and New Mexico, the reduction in National Forest timber harvest had significant impacts on closures or very low levels of capacity utilization at sawmills—the largest timber processing sector in the two States—and played a part in the closure of the two oriented strand board (OSB) operations in Colorado. Despite these trends, the actual number of timber processors in the two States increased from approximately 150 facilities during the 1980s to 182 facilities in 2003. Increases occurred most conspicuously in the log home and log furniture industries, where Colorado now ranks third behind Montana and Idaho, with Utah fourth in value of output from log home plants in the Western United States.

Timber Harvest

Harvest volumes presented in this report for calendar year 2002 came from the FIDACS census of Four Corners and out-of-state mills receiving timber harvested from the region. When available, similar timber harvest characterizations for the individual States (Arizona, Colorado, New Mexico, and Utah) were used for comparison. Periodic State-level reports (Wilson and Spencer 1967; Setzer and Wilson 1970; Setzer 1971 a,b; Green and Setzer 1974; Setzer and Barrett 1977; Setzer and Shupe 1977; Setzer and Throssell 1977 a,b; McLain 1985; McLain 1988; McLain 1989; Keegan and others 1995; Keegan and others 2001 a,b) provided the bulk of historic timber harvest information. Published timber harvest reports for recent years were not available, with the exception of Bureau of Land Management (BLM) forest products offerings and USDA Forest Service annual “cut and sold” reports. Small differences may exist between the numbers reported here and those in BLM and Forest Service reports. These differences are due to varying reporting units and conversion factors, rounding error, scaling discrepancies between sellers and buyers, and other reporting variations.

During calendar year 2002, more than 323.5 MMBF of timber was harvested from Arizona, Colorado, New Mexico, and Utah. This harvest volume represents less than 0.3 percent of the approximately 124.8 billion board feet of sawtimber on nonreserved timberlands in the four States (Benson and Green 1987; O’Brien 1999, 2002, 2003). Timber harvested from Four Corners timberland and manufactured into wood products came from three broad ownership classes: tribal lands, nonindustrial private forest (NIPF) land, and public lands. Most (72.5 percent) of the harvested volume came from tribal and NIPF timberlands, while 26.1 percent came from National Forests (table 4C-1). Ponderosa pine was the leading species harvested for timber in the Four Corners States during 2002, accounting for 57.8 percent of the total (table 4C-2). Spruces accounted for 14.5 percent, followed by Douglas-fir and lodgepole pine at 9.3 and 6.7 percent, respectively. Sawlogs were the leading component of the timber harvest in the Four Corners (table 4C-3); at 86.3 percent, no other product type came close in harvested volume. House logs contributed 6.4 percent to the total, while trees harvested for fiber logs and industrial fuelwood accounted for 4.6 percent of the harvest.

Timber Flow and Mill Receipts

During 2002, the Four Corners were net exporters of timber, with 20 percent (66.1 MMBF) of the regional harvest exported for processing in other States. Sawlogs constituted the bulk (97 percent, or 64.1 MMBF) of exported timber products, most of which were sold to California (table 4C-4). Mills in the Four Corners imported a total of 2.5 MMBF in 2002, approximately 1 percent of total receipts for the region. Of this imported volume, over 78 percent (almost 2.0 MMBF) was house logs. However, the region exported 1.9 MMBF of house logs as well. By ownership, timber from tribal lands was exported in the largest volumes. This flow of timber into and out of the region created a difference in the volume of timber harvested from the Four Corners and the volume received by the region’s mills. Most timber used by primary forest products firms in the Four Corners came from within the four-State region. Additional volume came from Idaho, Montana, and Wyoming, with some smaller volumes from Canada, California, and Oregon.

While the 2002 harvest exceeded 323.5 MMBF, total receipts by Four Corners mills were slightly less than 260.0 MMBF, a volume equivalent to 80 percent of the harvest. Sawlogs accounted for the vast majority (83 percent) of timber received by Four Corners mills (table 4C-5), followed by house logs (8 percent). The NIPF land-owners supplied the largest share (36 percent) of timber received by mills in the four

States, followed by tribal owners (33 percent) and National Forest System (NFS) lands (30 percent). Timber-processing capacity (the volume of timber that could be used by existing timber processors if demand for products were firm and sufficient raw material were available) in the Four Corners during 2002 was approximately 450 MMBF, Scribner. Thus, approximately 58 percent of timber-processing capacity in the region was utilized in 2002.

Forest Products Industry Composition and Operations

The FIDACS census identified 241 primary timber processing facilities active during 2002 in the Four Corners. These facilities included 105 sawmills, 67 log home or house log manufacturers, 38 log furniture producers, 14 post and pole facilities, 10 viga and latilla producers, and seven other facilities. Colorado and Utah had the most facilities and the largest shares of the log home and log furniture sectors. Arizona and New Mexico had fewer facilities but more of the viga and latilla sector.

Primary timber processors in the Four Corners produced an array of products including: dimension lumber, board and shop lumber, mine timbers, railroad ties, pallets, dunnage, excelsior, posts, poles, vigas, latillas, finished house logs, log homes, and log furniture, as well as wood pellets, fuelwood, bark, mulch, and pulp chips from mill residues. During 2002, production of lumber and other sawn products exceeded 274 MMBF, lumber tally. Lumber production in Arizona, Colorado, and New Mexico was about 82 MMBF for each State; Utah's lumber production was about 27 MMBF. Production of house logs, vigas, and latillas totaled more than 7.3 million lineal feet (MMLF), and more than 1.3 million pieces of log furniture, posts, and poles were produced by facilities in the Four Corners.

Mill Residue: Quantity, Types, and Use

A substantial portion of the wood fiber, including bark processed by primary forest product plants, ends up as mill residue. Three types of wood residues are typically generated by the primary wood products industry: coarse or chippable residue consisting of edging, slabs, trim, log ends, and pieces of veneer; fine residue consisting primarily of planer shavings and sawdust; and bark. The 2002 census collected information on volumes and uses of mill residue. Actual residue volumes, reported in bone-dry units (BDU), were obtained from facilities that sold all or most of their residues. All mills reported, on a percentage basis, how their residues were used. One BDU is the equivalent of 2,400 pounds of oven-dry wood.

Four Corners timber processors produced 305,190 BDU of residue during 2002, of which just 10,827 BDU (4 percent) went unused (table 4C-6). Coarse residues were the region's largest residue component (46 percent of all residues), with 3 percent going unused. About 60 percent of coarse residue was used by the pulp and board sector, 14 percent went to the energy sector, and an additional 23 percent went to other uses. Fine residue made up the second largest component (29 percent) in 2002, with sawdust comprising 16 percent and shavings 13 percent. All but 4,530 BDU (5 percent) of fine residue were used, primarily as animal bedding and mulch. Four Corners facilities generated 70,755 BDU of bark while processing timber in 2002, of which all but 3 percent was utilized. About 66 percent of bark was used as mulch, while almost 9 percent went to energy. During 2002, sawmills generated 279,060 BDU—91 percent of all mill residues in the region. Residue volume factors, which express mill residue generated per unit of lumber produced, were derived from production and from residue output volumes provided by mills (table 4C-7).

Forest Products Sales and Employment

Mills responding to the FIDACS survey summarized their calendar year 2002 shipments of finished wood products, providing information on volume, sales value, and geographic destination. Mills usually distributed their products either through their own distribution channels or through independent wholesalers and selling agents. Because of subsequent transactions, the geographic destination reported here may not reflect the final delivery points of shipments.

The Four Corners primary wood product sales value (f.o.b. the producing mill), including mill residues, totaled nearly \$222 million during 2002 (table 4C-8). Almost \$142 million (64 percent) of sales were within the Four Corners States, and slightly more than half (\$114 million) of all sales were lumber and other sawn products. House logs and log home sales accounted for almost \$50 million (22 percent) of total sales. Colorado led the region with more than \$98 million in sales, of which approximately \$28 million came from the log home sector. The remaining States had sales between \$36 and \$48 million (tables A18, N17, U16).

The forest products industry has traditionally played a comparatively small role in the economy of the Four Corners States. However, the industry has been, and continues to be, important at the community level, in particular in the more rural areas of the region. When looking at the primary sectors of the forest products industry, including logging, data indicate that approximately 3,800 full-time equivalent workers (FTEs, or number of people working 40-hour weeks, 240 day per year) were involved in primary production in the Four Corners during 2002. Of these, about 1,600 FTEs were involved in logging operations, and about 2,200 FTEs were in primary timber processing (QCEW 2004; REIS 2004). This corresponds to 5.0 FTEs per MMBF of timber harvested in the region, and 8.6 FTEs per MMBF of timber processed by mills in the region, with log home plants and log furniture makers often being substantially higher.

Table 4C-1—Four Corners timber harvest by ownership class, 2002.

Ownership class	MBF Scribner	Percentage of harvest
Private and tribal timberland	234,456	72.5
Tribal	134,840	41.7
Private	99,616	30.8
Public timberland	89,105	27.5
National Forest	84,536	26.1
Other public	4,569	1.4
All owners	323,561	100

Table 4C-2—Four Corners timber harvest by species, 2002.

Species	MBF Scribner	Percentage of harvest
Ponderosa pine	186,955	57.8
Spruces	46,850	14.5
Douglas-fir	30,165	9.3
Lodgepole pine	21,822	6.7
Aspen	20,399	6.3
Firs	16,882	5.2
Other species ^a	489	0.2
All species	323,561	100

^aOther species include juniper, other soft woods, and hardwoods other than aspen.

Table 4C-3—Four Corners timber harvest by product, 2002.

Product	MBF Scribner	Percentage of harvest
Sawlogs	279,317	86.3
House logs	20,695	6.4
Fiber logs and industrial fuelwood	14,763	4.6
Posts and poles	4,104	1.3
Vigas	3,655	1.1
Other products ^a	1,029	0.3
All products	323,561	100

^aOther products include furniture logs, pilings, and utility poles.

Table 4C-4—Four Corners timber products imports and exports, 2002.

Timber product	Imports	Exports	Net imports (Net exports)
	<i>----- Thousand board feet, Scribner -----</i>		
Sawlogs	360	64,150	(63,790)
House logs	1,967	1,910	57
Other products	177	50	127
All products	2,504	66,110	(63,606)

Table 4C-5—Timber received by the Four Corners primary forest products industry by ownership class and product, 2002.

Ownership class	Sawlogs	Fuelwood/ bioenergy	House logs	Post/pole	Other products ^a	All products
----- <i>Thousand board feet, Scribner</i> -----						
Private and tribal timberland	155,123	4,950	3,915	1,793	12,514	178,294
Private	75,693	600	3,457	1,168	12,514	93,432
Tribal	79,430	4,350	458	625	—	84,863
Public timberland	60,404	200	16,837	2,311	1,909	81,661
National Forest	58,462	200	15,278	2,005	1,811	77,756
Other owners ^b	1,942	—	1,558	306	99	3,905
All owners	215,527	5,150	20,751	4,104	14,423	259,955
----- <i>Percentage of product by ownership</i> -----						
Private and tribal timberland	72.0	96.1	18.9	43.7	86.8	68.6
Private	35.1	11.7	16.7	28.5	86.8	35.9
Tribal	36.9	84.5	2.2	15.2	—	32.6
Public timberland	28.0	3.9	81.1	56.3	13.2	31.4
National Forest	27.1	3.9	73.6	48.9	12.6	29.9
Other owners ^b	0.9	—	7.5	7.5	0.7	1.5
All owners	82.9	2.0	8.0	1.6	5.5	100

^aOther products include logs for log furniture, vigas, latillas, and fiber logs.

^bOther owners includes other public ownerships and Canadian imports.

Table 4C-6—Production and disposition of Four Corners mill residues, 2002.

Residue type	Total utilized	Pulp and board	Energy	Mulch/ bedding	Unspecified use	Unused	Total produced
----- <i>Bone-dry units^a</i> -----							
Coarse	140,860	86,377	20,851	—	33,632	4,020	144,879
Fine	85,026	14,953	3,530	58,436	8,107	4,530	89,556
Sawdust	44,840	3,105	3,530	37,347	858	4,358	49,198
Planer shavings	40,186	11,848	—	21,089	7,249	172	40,358
Bark	68,478	300	6,004	46,978	15,196	2,277	70,755
All residues	294,364	101,630	30,385	105,414	56,935	10,827	305,190
----- <i>Percentage of residue type by use</i> -----							
Coarse	97.2	59.6	14.4	0.0	23.2	2.8	47.5
Fine	94.9	16.7	3.9	65.3	9.1	5.1	29.3
Sawdust	91.1	6.3	7.2	75.9	1.7	8.9	16.1
Planer shavings	99.6	29.4	0.0	52.3	18.0	0.4	13.2
Bark	96.8	0.4	8.5	66.4	21.5	3.2	23.2
All residues	96.5	33.3	10.0	34.5	18.7	3.5	100

^aBone-dry unit = 2,400 lb oven-dry wood.

Table 4C-7—Four Corners sawmill residue factors, 2002.

Type of residue	BDU per MBF
Coarse	0.56
Sawdust	0.19
Planer shavings	0.16
Bark	0.28
Total	1.19

^aBone-dry unit (BDU = 2,400 lb oven-dry wood) of residue generated for every 1,000 board feet of lumber manufactured.

Table 4C-8—Destination and sales value of Four Corners primary wood products and mill residues, 2002.

Product	Within 4-Corner States	Other Rocky Mtn States	Far West ^a	Northeast ^b	South ^c	North Central ^d	Mexico, Canada, or other ^e	Total
----- Thousand 2002 dollars -----								
Lumber, mine timbers and other sawn products	70,389	10,453	10,156	119	16,560	5,310	1,229	114,216
House logs and log homes	38,261	1,317	136	489	8,122	1,339	—	49,664
Posts, poles, vigas, latillas, and log furniture	17,272	576	708	664	710	1,714	170	21,814
Other products ^f	15,884	24	6,678	3,528	2,333	5,315	2,181	35,943
Total	141,806	12,370	17,678	4,800	27,725	13,678	3,580	\$ 221,637
----- Percentage of regional sales by product -----								
Lumber, mine timbers and other sawn products	49.6	84.5	57.4	2.5	59.7	38.8	34.3	51.5
House logs and log homes	27.0	10.6	0.8	10.2	29.3	9.8	-	22.4
Posts, poles, vigas, latillas, and log furniture	12.2	4.7	4.0	13.8	2.6	12.5	4.7	9.8
Other products ^f	11.2	0.2	37.8	73.5	8.4	38.9	60.9	16.2
Total	64.0	5.6	8.0	2.2	12.5	6.2	1.6	100

^a Far West includes Alaska, California, Hawaii, and Washington.

^b Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

^c South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

^d North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

^e Other includes European countries.

^f Other products include excelsior, mill residues, mulch, and fuel pellets; they do not include paper products.

Arizona

This chapter focuses on Arizona's timber harvest and forest products industry during 2002, with discussion of changes that occurred since the 1998 industry census conducted by Keegan and others (2001a). Details of timber harvest, flow, and use are followed by descriptions of the primary processing sectors, capacity and utilization statistics, and mill residue characteristics. The chapter concludes with information on primary wood products industry sales by Arizona mills.

Timber Harvest, Flow, and Use

In 1999, Arizona had approximately 3.6 million acres of nonreserved timberland (O'Brien 2002), with National Forests accounting for 68 percent, private and tribal owners accounting for 31 percent, and other public agencies accounting for the remaining 1 percent (table A1). All private timberland was classified as NIPF timberland. With the exception of several Native American tribes, Arizona had no large tracts of timberland owned by entities operating primary wood processing facilities. Sawtimber volume on nonreserved timberlands was estimated at 24.9 billion board feet Scribner in 1999 (O'Brien 2002).

Timber harvest

Arizona's 2002 industrial timber harvest was 128.2 MMBF Scribner, nearly 70 percent greater than the 1998 harvest, but about one-third the annual harvest during the late 1980s (Keegan and others 2001a). The decline in Arizona's total annual timber harvest since 1990 was largely due to the decline in National Forest timber harvest. The major factor that contributed to the harvest increase from 1998 to 2002 was the salvage of 90 MMBF of dead, mostly fire-killed, timber, accounting for 70 percent of the 2002 harvest volume. In 1998 dead trees accounted for just 3 percent (2.4 MMBF) of the total harvest. Although substantial acreages on both public and tribal forests experienced fires between 1998 and 2002, tribal landowners were able to respond relatively quickly and harvested over 82 MMBF of fire-killed timber in 2002.

As National Forest and total timber harvest in the State declined, a disproportionate and diminishing share of Arizona's timber harvest came from National Forest timberlands in recent years (table A2). In 1966, 1974, and 1984 National Forests accounted for 60 percent or more of harvested volume (Setzer and Throssell 1977a; McLain 1988), whereas in 1998 and 2002 National Forests accounted for 37 and 16 percent of harvest volume, respectively (Keegan and others 2001a). National Forests provided the majority (89 percent) of house logs harvested in 2002, but tribal and NIPF landowners provided the majority of sawlogs and other products (table A3). Sawlogs accounted for almost 95 percent (121 MMBF) of the total volume harvested.

In 2002, as in 1998, Navajo County led Arizona's timber harvest with 50 percent of the volume (Keegan and others 2001a); Gila and Coconino Counties followed with 31 and 12 percent, respectively (table A4). Historically, 80 percent or more of the State's annual timber harvest came from three counties: Apache, Coconino, and Navajo. In 1984, Apache led followed by Coconino and Navajo (McLain 1988). In 1974, Coconino County led the state with almost 38 percent of the harvest, followed by Navajo with 34 percent and Apache with 19 percent (Setzer and Throssell 1977a). Similarly, Coconino County was the largest timber producer in 1969, contributing 32 percent of the harvest, followed by Apache and Navajo with 25 and 23 percent, respectively (Setzer 1971a).

Ponderosa pine continued to be the leading species harvested in Arizona, accounting for 95 percent of the harvest in 2002 (table A5). Douglas-fir, white and subalpine

firs, and Engelmann spruce were harvested in relatively small quantities (table A6), but the salvage of 86 MMBF of fire- and beetle-killed ponderosa pine in 2002 dwarfed the harvest of all other species. In 1984, ponderosa pine also accounted for more than 90 percent of the harvest (347 MMBF of 383 MMBF harvested), but McLain (1988) reported that live trees accounted for 97 percent of the harvest volume. Ponderosa pine was the leading species harvested for each timber product in 2002 (table A7). Engelmann spruce comprised 44 percent of the house log harvest, and Douglas-fir, true firs, and Engelmann spruce were also small components of the sawlog harvest.

Timber flow

The majority (59 percent) of Arizona's 2002 timber harvest was processed in-State. However, Arizona was a net exporter of timber. More than 52 MMBF were exported for processing in California, Colorado, and Utah, while a small amount of timber was imported from Idaho, Oregon, and Utah for processing in Arizona (table A8).

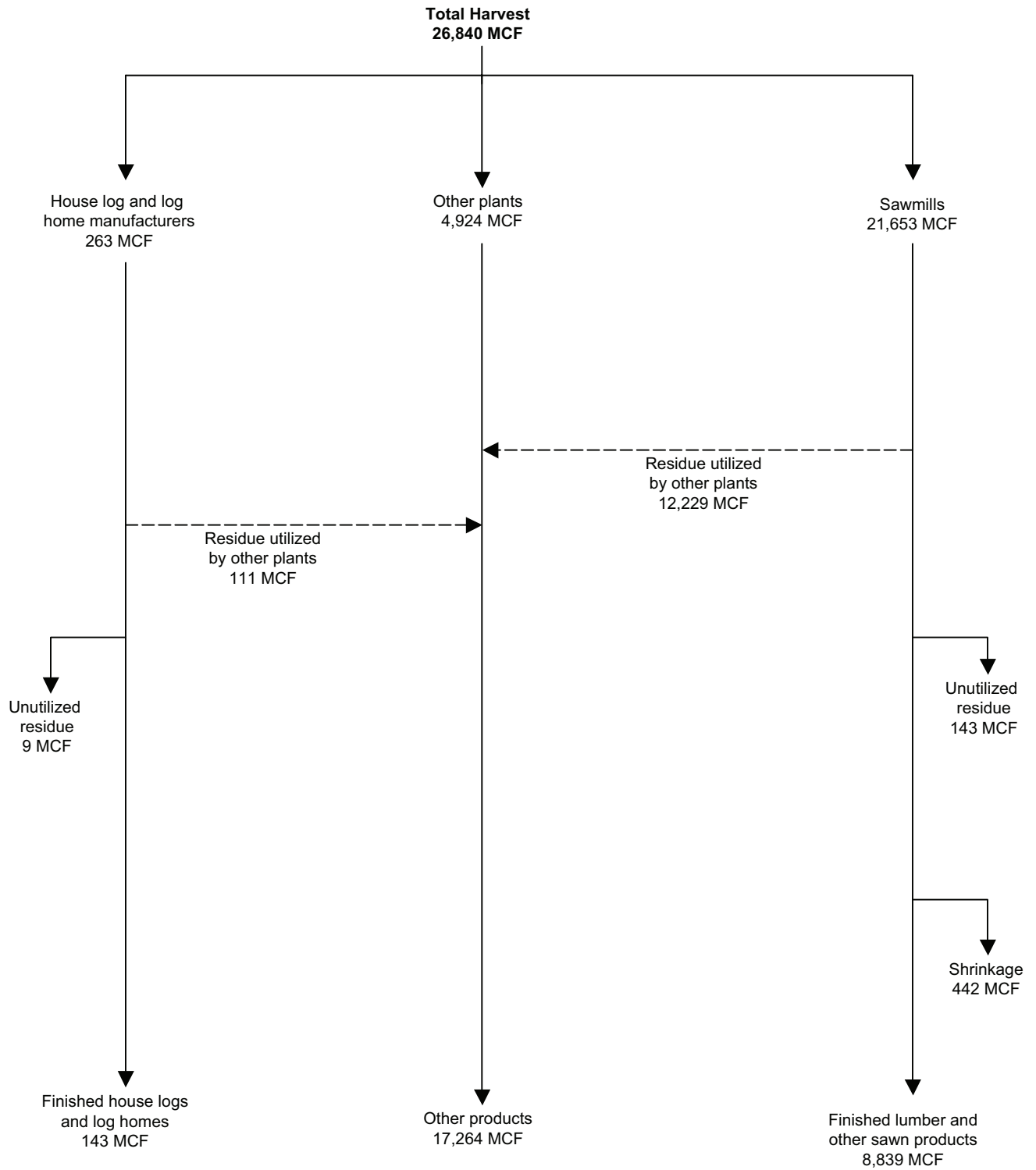
Timber processors in Arizona received 76,114 MBF of timber in 2002, including 84 MBF that was harvested outside the State. Ownership sources of timber delivered to Arizona mills in 2002 were similar to 1998. More than 70 percent of all receipts came from private and tribal timberlands and less than 30 percent from National Forests (table A9), which supplied timber to 10—almost half—of Arizona's mills in 2002. National Forests provided Arizona log home manufacturers with 79 percent of the house log volume processed in-State, with NIPF landowners providing the remaining 21 percent (table A10). However, the majority (70 percent) of house log volume harvested in Arizona was hauled out of state for processing in Colorado and Utah.

Timber use

Arizona's 2002 timber harvest—approximately 26,840 MCF, exclusive of bark (fig. A1)—was used by several manufacturing sectors both within and outside Arizona. Of this volume, 21,653 MCF went as logs to sawmills, 263 MCF went to log home manufacturers, and 4,924 MCF went to other plants, including post, pole, viga, latilla, and wood pellet manufacturers, as well as residue-utilizing facilities including bioenergy facilities, pulp mills, reconstituted board plants, and mulch and animal bedding producers. Volumes are presented in cubic feet rather than board feet Scribner because both mill residues and timber products are displayed. The following conversion factors were used to convert Scribner board foot volume to cubic feet:

- 5.98 board feet per cubic foot for house logs;
- 5.61 board feet per cubic foot for sawlogs;
- 1.05 board foot per cubic foot for all other products.

Of the 21,653 MCF of timber received by sawmills, 8,839 MCF (41 percent) became finished lumber or other sawn products, and about 442 MCF was lost to shrinkage. The remaining 12,372 MCF (57 percent) became mill residue. About 12,229 MCF of sawmill residue was utilized by other sectors both within Arizona and in other States—5,880 MCF for biomass energy; and 6,349 MCF for pulp, livestock bedding, or mulch. Only 143 MCF (1 percent) of sawmill residue remained unused. Of the 263 MCF of timber received by log home manufacturers, 143 MCF (54 percent) became house logs. The remaining 120 MCF became mill residue. About 111 MCF of house log residue was used by other sectors; and about 9 MCF remained unused. Of the 4,924 MCF of timber received by other manufacturers, all was utilized for solid wood products such as posts, vigas, or latillas, or used in residue-related products like mulch, livestock bedding, fuel pellets, or for biomass energy production.



^aOther plants include post, pole, viga, latilla, and wood pellet manufacturers, as well as residue-utilizing facilities including bioenergy facilities, pulpmills, reconstituted board plants, and mulch and animal bedding producers.

Figure A1—Arizona timber harvest and flow, 2002.

Forest Industry Sectors

Arizona's primary forest products industry in 2002 consisted of 23 active manufacturers in six counties (table A11). Facilities tended to be located near the forest resource along the northern side of the Mogollon Plateau, with concentrations in southern Apache and Navajo counties (fig. A2). The sawmill sector, manufacturing lumber and other sawn products, was the largest sector operating in 2002 with 11 facilities—five more than were operating in 1998. Five facilities produced house logs and log homes, an increase of one since 1998. Two viga and latilla manufacturers, a post and pole manufacturer, a log furniture producer, one mulch producer, one fuel pellet manufacturer, and a biomass energy facility were also actively purchasing or utilizing timber in 2002. These seven firms were indicative of the increased diversity of timber-processors that developed in Arizona since the end of the 1980s. One paper mill utilizing recycled material also operated in Arizona during 2002 but did not receive any timber or mill residue. As recently as 1998 this facility used some roundwood pulpwood and mill residues and was included in previous reports (McLain 1988; Keegan and others 2001a).

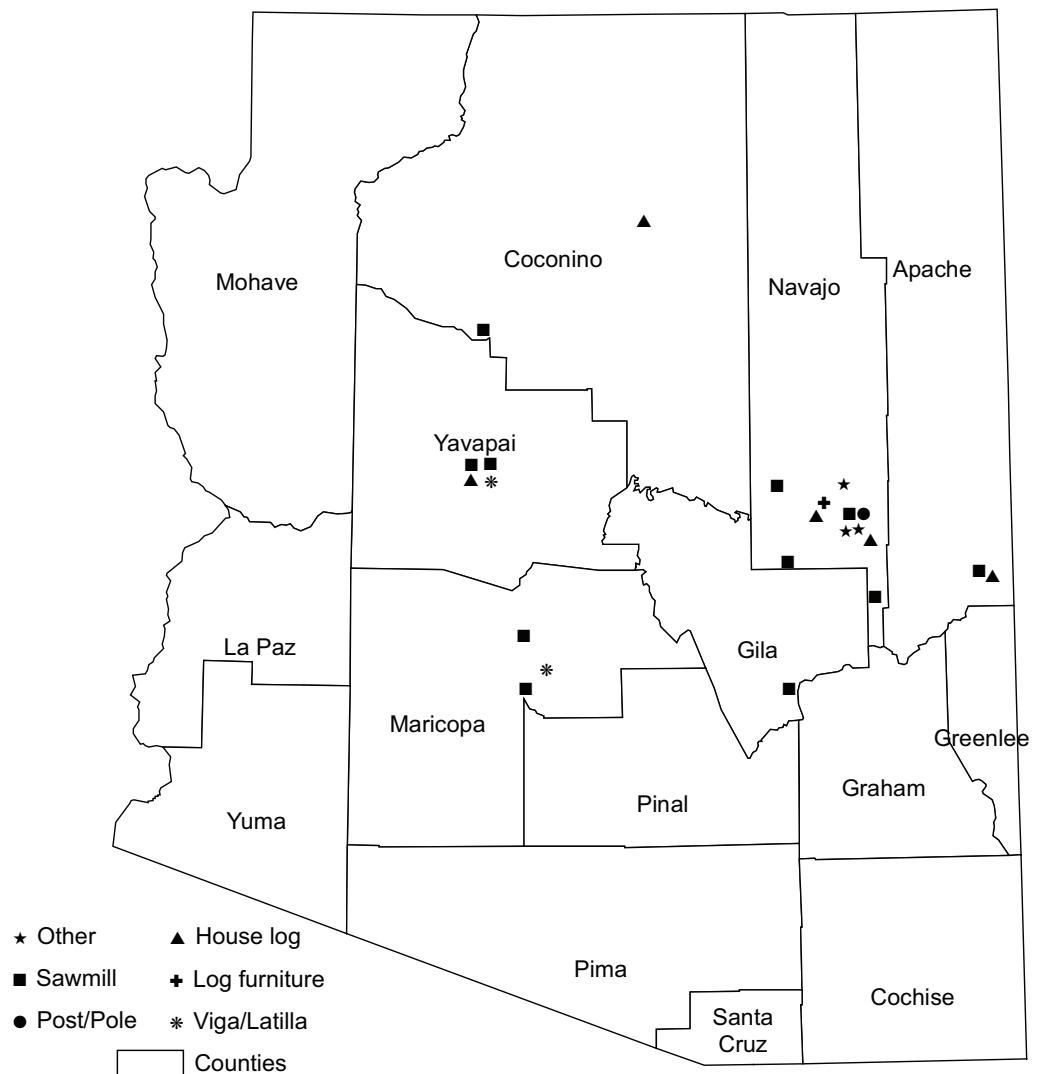


Figure A2—Arizona active primary timber processors, 2002.

Primary wood products sales as well as the number and variety of producers increased since 1998, with finished product sales in 2002 about 6 percent higher than in 1998 (table A12). The 2002 sales increase over 1998, however, did not occur in the sawmill industry, but in the more recently developed log home and other products sectors where sales increased 300 percent since 1998. In 1990, the four firms manufacturing products other than lumber accounted for only \$570,000, less than 0.5 percent of total wood products sales that year (Keegan and others 2001a). In 2002, sales from the house log and other products manufacturers approached \$7.2 million, and accounted for 21 percent of finished products sales.

Sawmill sector

Although the number of sawmills in Arizona nearly doubled, total lumber production increased only slightly from about 81 MMBF in 1998 to less than 83 MMBF in 2002 (table A13). Two of the State's four largest sawmills closed between 1998 and 2002, shifting a larger proportion of the State's lumber production into small mills producing less than 10 MMBF annually. Consequently, average annual lumber production per mill decreased from 13.5 MMBF in 1998 to 7.5 MMBF (table A14). The State's four largest sawmills in 2002 produced an average of 19.0 MMBF, and the remaining seven mills had an average lumber production of less than 1.0 MMBF (table A15).

On average, Arizona sawmills produced approximately 1.27 board feet of lumber for every board foot Scribner of timber processed for an average overrun of 27 percent in 2002. Overrun was 46 percent in 1998 (Keegan and others 2001a). The 13 percent overrun decline was likely due to the relatively large proportion of salvage timber processed and the resulting size, condition, and product mix that could be recovered from the burned timber. In 1998, about 64 percent of the lumber produced by Arizona's sawmills was dimension and studs, 35 percent was board and shop lumber, and less than one percent was timbers (Keegan and others 2001a). In 2002, only 22 percent of the lumber produced by Arizona's sawmills was dimension and studs; while 69 percent was board and shop lumber, and timbers, cants, or pallets constituted 19 percent of production.

Historically, the sawmill sector has accounted for more than 99 percent of wood products sales in Arizona. By 1998 that proportion had slipped to 93 percent, as timber harvest levels declined and the number of sawmills decreased. Sales from sawmills accounted for just 79 percent (\$27.7 million) of finished products sales in 2002, decreasing from \$30.6 million in 1998 (Keegan and others 2001a). Board and shop lumber accounted for \$15.9 million (57 percent) of sawmill sales in 2002, dimension lumber was \$6.9 million (25 percent) of sales, and mine timbers, cants, and pallets accounted for \$4.9 million (18 percent).

Log home sector

Expansion continued in Arizona's log home sector. One more house log manufacturer was identified in 2002 than in 1998 and two more than in 1990 (table A11). Only firms that process timber and manufacture house logs or log homes, not log home distributors, were included in the 1990, 1998, and 2002 censuses. In 2002, Arizona's five log home manufacturers processed 490 MBF Scribner of timber, produced about 160 MLF of house logs, and generated about \$2 million in product sales. Although inflation-adjusted sales were higher in 1998 (\$2.2 million), the volume of timber processed increased 35 percent and volume of house logs produced increased 55 percent.

Other products sector

As with the log home sector, expansion continued among Arizona's producers of other primary wood products, with three more facilities operating in 2002 than in 1998 and four more than in 1990 (table A11). Finished products sales by manufacturers of posts, poles, vigas, latillas, fuel pellets, and log furniture exceeded \$5.1 million in 2002. A specific sales value was not reported in 1998 to avoid disclosure of firm level data (Keegan and others 2001a); however, sales from the sector were estimated to have increased more than twentyfold from 1998 to 2002. Additional detail about the sector must be withheld to protect the confidentiality of firm level information.

Capacity and Utilization

Two aspects of capacity were examined for calendar year 2002 in Arizona and the other Four Corners States: production capacity and timber-processing capacity. Production capacity was defined as the amount of finished product that could be produced given sufficient supplies of raw materials and firm market demand for the products, considering normal maintenance and down time. Primary wood products producers specified annual and 8-hour shift production capacities in units of output (for example, MBF of lumber, MLF of house logs, number of vigas, etc.) for each firm. Product recovery ratios were calculated for each firm using reported timber input and product output volumes. Timber-processing capacity was defined as the volume of timber reported in MBF Scribner that could be processed given sufficient supplies of raw materials and firm market demand for the products, and was estimated for each firm by applying the product recovery ratios to production capacity.

Arizona's annual sawmill production capacity was 115,490 MBF of lumber in 2002. Producing 82,658 MBF of lumber, sawmills utilized about 72 percent of their lumber production capacity. Across all industry sectors, total timber-processing capacity was 98,465 MBF Scribner. Accounting for changes in log inventories, a total of 71,670 MBF Scribner was processed by Arizona firms in 2002, with timber-processing capacity utilization about 73 percent. Sawtimber-processing capacity was 141,480 MBF Scribner in 1998, with 53,458 MBF Scribner (38 percent) utilized (Keegan and others 2001a). In 2002, sawtimber-processing capacity fell to 98,025 MBF Scribner, with 71,260 MBF Scribner (73 percent) utilized. The decreased sawtimber-processing capacity and increased capacity utilization resulted from the permanent closure of two large sawmills, which were operating well below capacity in 1998.

Mill Residue Volumes, Types, and Uses

In 1998, Arizona's lone paper mill was the largest consumer of mill residues that were generated in the State. However, that mill shifted to using recycled material and did not use either roundwood pulpwood or mill residues in 2002. This change affected not only the ways and amounts of residues that were utilized, but it also impacted other sectors' ability to operate profitably. Sawmills, the leading timber processors, were also the main residue producers in Arizona. These facilities had to develop new markets for their residues, utilize the residues in-house, or consider cutting production to avoid generating more residue than could be disposed of affordably.

In 2002, Arizona mills produced 80,989 BDU, approximately 7,775 MCF of mill residue, with 98.6 percent utilized (table A16). Both residue production and the proportion utilized decreased from 1998. In 1998, Arizona sawmills generated 8,687 MCF, utilizing 99.9 percent (Keegan and others 2001a). Arizona's drop in residue utilization between 1998 and 2002 signaled a reversal of the long-term trend of increased residue

utilization noted by Keegan and others (2001a) and was largely attributable to changes at the State's paper mill. The decrease in total residue volume generated, however, was attributable to sawmills creating less residue per unit of lumber produced. In 1998, sawmills produced about 1.12 BDU per MBF of lumber; by 2002 that residue factor had dropped to 0.96 BDU per MBF of lumber (table A17).

Three types of wood fiber residue have been produced by Arizona mills: coarse residue consisting of slabs, edging, trim, peelings, and log ends; fine residue consisting of planer shavings and sawdust; and bark. Coarse residue was the State's largest residue component at 37,776 BDU (46.6 percent) of all residues in 2002, with 99 percent utilized. Out-of-State pulp and paper facilities used about 26,600 BDU of the coarse material, with the remaining utilized volume going to energy and unspecified uses (table A16). Fine residues comprised the second largest component at 24,467 BDU (30.2 percent) of mill residues. Only 97.4 percent of fine residue was utilized in 2002, primarily as mulch or animal bedding. Bark accounted for 23.1 percent of all residues and was largely used for mulch or unspecified products in 2002, with 18,648 BDU (99.5 percent) utilized.

Primary Forest Products Markets and Sales

Sales from Arizona's primary wood products industry in 2002 totaled \$38.8 million, including finished products and mill residues (table A18). Lumber, mine timbers, and other sawn products accounted for 71 percent (\$27.7 million) of total sales; house logs and log homes accounted for 5 percent (\$1.9 million); while other products and mill residues accounted for 24 percent (\$9.2 million). Arizona was the leading market area for lumber, log homes, and other products, with in-State sales accounting for 56.5 percent of total sales. The other Four Corners States (Colorado, New Mexico, and Utah) accounted for 32.5 percent of total sales, with lumber playing a significant role. The Far West States were a major market area for other products, including mill residues.

Table A1—Arizona nonreserved timberland by ownership class
(source: O'Brien 2002).

Ownership class	Thousand acres	Percentage of nonreserved timberland
National Forest	2,424	68
Private and tribal	1,096	31
Other public	44	1
Total	3,565	100

Table A2—Proportion of Arizona timber harvest by ownership class, selected years.

Ownership class	1966	1974	1984	1998	2002
	----- <i>Percentage of harvest</i> -----				
Private and tribal timberland	25.0	41.0	33.5	63.0	84.4
Private	1.0	—	33.5	3.0	1.6
Tribal	24.0	41.0	—	60.0	82.8
Public timberland	75.0	59.0	66.5	37.0	15.6
National Forest	75.0	59.0	66.2	37.0	15.6
Other public	—	—	0.3	—	—
All owners	100	100	100	100	100

Table A3—Arizona timber products harvested by ownership class, 2002.

Ownership class	Sawlogs	House logs	Other products^a	All products
	----- <i>Thousand board feet, Scribner</i> -----			
Tribal timberland	101,800	60	4,350	106,210
National Forest	18,385	1,389	195	19,969
Private timberland	1,260	109	672	2,041
All owners	121,445	1,558	5,217	128,220
	----- <i>Percentage of harvested product by ownership</i> -----			
Tribal timberland	83.8	3.9	83.4	82.8
National Forest	15.1	89.2	3.7	15.6
Private timberland	1.0	7.0	12.9	1.6
All owners	94.7	1.2	4.1	100

^aOther products include industrial fuelwood, furniture logs, fiber logs, and viga logs.

Table A4—Arizona timber harvest by county, selected years (sources: McLain 1988, Keegan and others 2001a).

County	1984	1998	2002	1984	1998	2002
	----- <i>MBF Scribner</i> -----			----- <i>Percentage</i> -----		
Apache	171,128	15,641	6,350	44.7	20.5	5.0
Coconino	150,727	15,314	14,889	39.4	20.1	11.6
Gila	931	5,405	39,960	0.2	7.1	31.2
Graham	—	—	1,100	—	—	0.9
Greenlee	4,623	1,515	—	1.2	2.0	—
Navajo	52,745	38,384	64,027	13.8	50.3	49.9
Pima	—	33	—	—	<0.05	—
Yavapai	2,220	20	1,895	0.6	<0.05	1.5
Total ^a	382,674	76,312	128,220	100	100	100

^aPercentage detail may not sum to 100% due to rounding.

Table A5—Proportion of Arizona timber harvest by species, selected years (sources: Setzer 1971, Setzer and Throssell 1977, McLain 1988, Keegan and others 2001a).

Species	1969 ^a	1974 ^a	1984	1998	2002
	----- <i>Percentage of harvest</i> -----				
Ponderosa pine	74.2	69.6	90.6	87.5	94.8
Douglas-fir	5.3	5.6	4.5	6.9	2.4
White fir	3.6	4.8	2.4	1.3	1.5
Engelmann spruce	0.9	2.1	2.3	3.1	1.2
Pinyon pine, juniper, limber pine, aspen	16.0	17.9	0.2	1.2	<0.05
All species ^b	100	100	100	100	100

^aHarvest data for 1969 and 1974 include fuelwood; 1984, 1998, 2002 do not include fuelwood.

^bPercentage detail may not add to 100 due to rounding.

Table A6—Arizona timber harvest by species, selected years (sources: McLain 1988, Keegan and others 2001a).

Species	1984	1998	2002
	----- <i>MBF Scribner</i> -----		
Ponderosa pine	346,851	66,804	121,614
Douglas-fir	17,217	5,264	3,129
White fir	9,214	961	1,900
Engelmann spruce	8,667	2,340	1,551
Other species ^a	722	943	26
All species ^b	382,674	76,312	128,220

^aOther species include juniper, other softwoods, and hardwoods.

^bMay not sum due to rounding.

Table A7—Arizona timber harvest by species and product, 2002.

Species	Sawlogs	House logs	Other products ^a	All products
----- <i>Thousand board feet, Scribner</i> -----				
Ponderosa pine	115,592	808	5,214	121,614
Douglas-fir	3,093	35	1	3,129
Engelmann spruce	861	690	1	1,551
True firs ^b	1,900	—	—	1,900
Other species ^c	—	25	1	26
All species	121,445	1,558	5,217	128,220
----- <i>Percentage of product by species</i> -----				
Ponderosa pine	95.2	51.9	99.9	94.8
Douglas-fir	2.5	2.2	0.0	2.4
Engelmann spruce	0.7	44.3	0.0	1.2
True firs ^b	1.6	—	—	1.5
Other species ^c	—	1.6	0.0	<0.05
All species	94.7	1.2	4.1	100

^aOther products include industrial fuelwood, furniture logs, fiber logs, and viga logs.

^bTrue firs include white and subalpine fir.

^cOther species include juniper, other softwoods, and hardwoods.

Table A8—Arizona timber products imports and exports, 2002.

Timber product	Imports	Exports	Net imports (Net exports)
----- <i>Thousand board feet, Scribner</i> -----			
Sawlogs	—	51,095	(51,095)
House logs	50	1,085	(1,035)
Other products ^a	34	10	24
All products	84	52,190	(52,106)

^aOther products include furniture logs, fiber logs, and viga logs.

Table A9—Ownership of timber products received by Arizona mills, 1998 and 2002 (source: Keegan and others 2001a).

Ownership class	1998		2002	
	MBF Scribner	Percentage of total	MBF Scribner	Percentage of total
Private and tribal timberland	48,102	71.1	58,108	76.3
Tribal	45,964	68.0	56,150	73.8
Private	2,138	3.2	1,958	2.6
National Forests	19,510	28.9	18,006	23.7
All owners	67,612	100	76,114	100

Table A10—Timber received by Arizona forest products industry by ownership class and product, 2002.

Ownership class	Sawlogs	House logs	Other products ^a	All products
<i>----- Thousand board feet, Scribner -----</i>				
Private and tribal timberland	52,965	109	5,034	58,108
Private	1,165	109	684	1,958
Tribal	51,800	—	4,350	56,150
Public timberland	17,385	414	207	18,006
National Forest	17,385	414	207	18,006
All owners	70,350	523	5,241	76,114
<i>----- Percentage of product by owner -----</i>				
Private and tribal timberland	75.3	20.8	96.0	76.3
Private	1.7	20.8	13.1	2.6
Tribal	73.6	—	83.0	73.8
Public timberland	24.7	79.2	4.0	23.7
National Forest	24.7	79.2	4.0	23.7
All owners	92.4	0.7	6.9	100

^aOther products include industrial fuelwood, furniture logs, fiber logs, and viga logs.

Table A11—Active Arizona primary wood products facilities by county and product, 2002 (sources: McLain 1988; Keegan and others 2001a).

County	Log homes					Total
	Lumber	and house logs	Vigas and latillas	Other products ^a	Pulp and paper	
Apache	1	1				2
Coconino	1	1				2
Gila	1					1
Maricopa	2		1			3
Navajo	4	2		5		11
Yavapai	2	1	1			4
2002 Total	11	5	2	5	0	23
1998 Total	6	4	0	2	1	13
1990 Total	14	3	0	1	1	19
1984 Total	20	0	0	2	1	23

^aOther products include posts, poles, vigas, latillas, fuel pellets, log furniture, and biomass energy.

Table A12—Finished product sales of Arizona's primary wood products sectors, selected years (sources: WWPA various years; Keegan and others 2001a).

Sector	1984	1990	1998	2002
<i>----- Thousands of 2002 dollars -----</i>				
Sawmills	\$176,934	\$144,784	\$30,640	\$27,677
Log home and other sectors ^a	248	570	2,393	7,193
Total ^b	\$177,182	\$145,354	\$33,033	\$34,870

^aOther sectors include producers of posts, poles, vigas, latillas, log furniture, and fuel pellets.

^bAll sales are reported f.o.b. the manufacturer's plant. Sales of mill residues, mulch, and paper not included for comparison to previous years.

Table A13—Arizona sawmills by production size class, selected years (sources: Setzer and Wilson 1970; WWPA 1992, 1993; Keegan and others 2001a).

Year	Under 10 MMBF ^a	Over 10 MMBF ^a	Total
----- <i>Number of sawmills</i> -----			
2002	9	2	11
1998	2	4	6
1990	5	9	14
1966	13	10	23
<i>Percentage of lumber output</i>			<i>Volume (MBF^b)</i>
2002	25	75	82,658
1998	1	99	80,970
1990	4	96	388,000
1966	11	89	437,000

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table A14—Number of Arizona sawmills and average lumber production, selected years (sources: McLain 1988; Setzer and Wilson 1970; Keegan and others 2001a).

Year	Number of sawmills	Average lumber production
		<i>MMBF^a</i>
2002	11	7.5
1998	6	13.5
1990	14	27.7
1984	20	19.2
1966	23	19.0
1962	28	11.6
1960	38	8.7

^aMMBF = million board feet lumber tally.

Table A15—Arizona lumber production by mill size, 2002.

Size class ^a	Number of mills	Volume	Percentage of total	Average per mill
		<i>MBF^b</i>		
Over 5 MMBF	4	75,890	92	18,973
Under 5 MMBF	7	6,768	8	967
Total	11	82,658	100	7,514

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table A16—Production and disposition of Arizona mill residues, 2002.

Residue type	Total utilized	Pulp and board	Energy	Mulch/ bedding	Unspecified use	Unused	Total produced
----- <i>Bone-dry units</i> ^a -----							
Coarse	37,390	26,600	429	—	10,360	386	37,776
Fine	23,825	—	—	23,425	400	642	24,467
Sawdust	11,864	—	—	11,464	400	642	12,506
Planer shavings	11,961	—	—	11,961	—	—	11,961
Bark	18,648	—	2	7,646	11,000	98	18,746
Total	79,863	26,600	432	31,071	21,760	1,126	80,989
----- <i>Percentage of residue type</i> -----							
Coarse	99.0	70.4	1.1	—	27.4	1.0	46.6
Fine	97.4	—	—	95.7	1.6	2.6	30.2
Sawdust	94.9	—	—	91.7	3.2	5.1	15.4
Planer shavings	100.0	—	—	100.0	—	—	14.8
Bark	99.5	—	0.0	40.8	58.7	0.5	23.1
Total	98.6	32.8	0.5	38.4	26.9	1.4	100

^aBone-dry unit = 2,400 lb oven-dry wood.

Table A17—Arizona sawmill residue factors, 1998 and 2002 (source: Keegan and others 2001a).

Type of residue	1998	2002
<i>BDU/MBF lumber tally^a</i>		
Coarse	0.50	0.44
Sawdust	0.22	0.15
Planer shavings	0.19	0.14
Bark	0.21	0.23
Total	1.12	0.96

^aBone-dry unit (BDU = 2,400 lb oven-dry wood) of residue generated for every 1,000 board feet of lumber manufactured.

Table A18—Destination and sales value of Arizona’s primary wood products and mill residues, 2002.

Product	Arizona	Other 4-Corner States	Other Rocky Mtn States	Far West ^a	Northeast ^b	South ^c	North Central ^d	Mexico, Canada, or other ^e	Total
----- <i>Thousand 2002 dollars</i> -----									
Lumber, mine timbers, and other sawn products	\$15,754	\$10,721	—	\$338	—	—	\$788	\$90	\$27,691
House logs and log homes	1,269	328	—	—	—	119	219	—	1,936
Other products ^f	4,903	1,542	—	2,546	—	—	—	170	9,162
Total	\$21,926	\$12,592	—	\$2,884	—	\$119	\$1,006	\$260	\$38,788
----- <i>Percentage of regional sales by product</i> -----									
Lumber, mine timbers, and other sawn products	71.8	85.1	—	11.7	—	—	78.2	34.6	71.4
House logs and log homes	5.8	2.6	—	—	—	100.0	21.8	—	5.0
Other products ^f	22.4	12.2	—	88.3	—	—	—	65.4	23.6
Total	56.5	32.5	—	7.4	—	0.3	2.6	0.7	100

^a Far West includes Alaska, California, Hawaii, and Washington.

^b Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

^c South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

^d North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

^e Other includes European countries.

^f Other products include posts, poles, vigas, latillas, log furniture, mill residues, mulch, and fuel pellets; they do not include paper products.

Colorado

This chapter focuses on Colorado's timber harvest and forest products industry during 2002. Details of timber harvest, flow, and use are followed by descriptions of the primary processing sectors, capacity and utilization statistics, and mill residue characteristics. The chapter concludes with information on primary wood products industry sales by Colorado mills. Comparisons to previous years are provided where possible. Limited historical information is available about timber harvesting and mill production and residues in Colorado. The last comprehensive report on the State's industrial roundwood production and mill residues was conducted in 1982 (McLain 1985), and data for previous years include 1962 (Spencer and Farrenkopf 1964), 1969 (Setzer 1971b), and 1974 (Setzer and Shupe 1977). More recently, Lynch and Mackes (2001) provided a brief discussion of Colorado timber harvest in their study of wood use in Colorado from 1997 to 2000.

Timber Harvest, Flow, and Use

In 1983, Colorado had approximately 13.8 million acres of nonreserved timberland (Benson and Green 1987), with National Forests accounting for 65 percent, private owners accounting for 24 percent, and other public agencies accounting for the remaining 11 percent (table C1). All private timberland was classified as NIPF timberland. Colorado had no large tracts of timberland owned by entities operating primary wood processing facilities. Sawtimber volume on timberland was estimated at 52.7 billion board feet Scribner in 1983 (Benson and Green 1987).

Timber harvest

Colorado's 2002 industrial timber harvest was 79.7 MMBF Scribner, nearly 23 percent less than the 1982 harvest of 103 MMBF Scribner (McLain 1985), and almost 28 percent less than the 1999 harvest of 110 MMBF reported by Lynch and Mackes (2001). Recent decreases in Colorado's total annual timber harvest occurred despite increased salvage of dead timber, accounting for 26 percent (20 MMBF) of the 2002 harvest volume. In 1982 dead trees accounted for just 8 percent of the total harvest volume (McLain 1985).

As in most of the Western States, decreasing Federal timber harvests have led to smaller total harvest volumes and greater shares of annual timber harvest coming from other ownership sources. Private and tribal landowners provided the majority of Colorado's timber harvest in recent years. Lynch and Mackes (2001) indicated that National Forests provided about 47 percent of the 1999 harvest. In 2002, the National Forest share of Colorado's timber harvest had dropped to 38 percent (table C2). In 1974 and 1982, National Forests accounted for 90 and 80 percent, respectively, of harvested volume (Setzer and Shupe 1977, McLain 1985). National Forests did provide the majority (66 percent) of house logs harvested in 2002, but NIPF landowners provided the majority of sawlogs, posts, poles, and other products (table C3). Sawlogs accounted for about 81 percent (64 MMBF) of the total volume harvested, house logs and other products accounted for about 9 percent each, and posts and poles were about 2 percent of the harvest in 2002.

During 2002, Garfield County led Colorado's timber harvest with just under 12 percent (9.3 MMBF Scribner) of the volume; Mesa and Las Animas Counties followed with 11 and 9 percent, respectively (table C4). In 1982, Jackson and Montezuma Counties led the harvest with more than 15 MMBF (14 percent) of the harvest each (McLain 1988).

Ponderosa pine was the leading species harvested in Colorado, accounting for 28 percent of the harvest in 2002 (table C5). Spruces, including Engelmann and blue spruce, accounted for 25 percent, with aspen and cottonwood accounting for 19 percent. In 1982, spruces were the leading species harvested, accounting for slightly more than 40 percent, while ponderosa pine accounted for 22 percent (McLain 1985). Ponderosa pine and spruce were the leading species harvested for sawlogs in 2002, accounting for 31 and 25 percent, respectively (table C6). Spruces comprised 50 percent of the house log harvest, lodgepole pine was the leading species harvested for posts and poles, and aspen and cottonwood accounted for 92 percent of the volume harvested for other products.

Timber flow

The majority (89 percent) of Colorado's 2002 timber harvest was processed in-State; however, Colorado was a net exporter of about 4 MMBF of timber. About 9 MMBF were exported for processing in Wyoming, Utah, New Mexico, and Idaho; while 5 MMBF were imported from Utah, New Mexico, Idaho, Arizona, California, Montana, Oregon, and Canada for processing in Colorado (table C7).

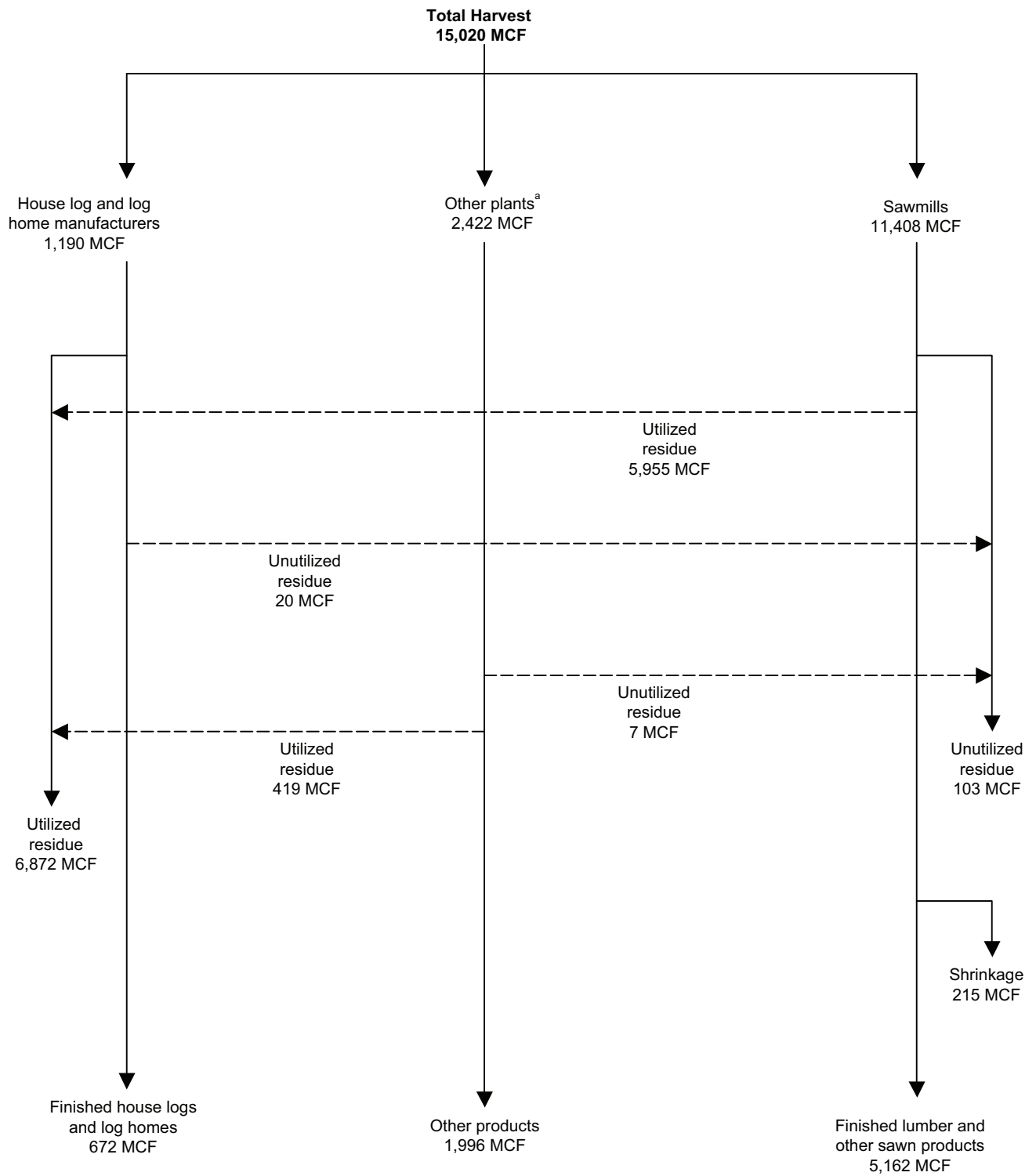
Timber processors in Colorado received 82,464 MBF of timber in 2002, including 5,073 MBF that was harvested outside the State. Private and tribal timberlands provided 63 percent of the timber delivered to Colorado mills in 2002, with 51,665 MBF coming from private lands and 583 MBF from tribal lands (table C8). National Forests provided about 34 percent (27,691 MBF) of timber receipts, with 58—slightly less than half—of Colorado's timber processors receiving timber cut from National Forests. During 2002, National Forests provided Colorado log home manufacturers with 64 percent of the house log volume processed in-State, NIPF landowners provided 23 percent, and 10 percent came from Canada. Private timberlands supplied the majority of sawlogs, posts and poles, and other products processed in Colorado.

Timber use

Colorado's 2002 timber harvest—approximately 15,020 MCF, exclusive of bark (fig. C1)—was used by several manufacturing sectors both within and outside of Colorado. Of this volume, 11,408 MCF went as logs to sawmills, 1,190 MCF went to log home manufacturers, and 2,422 MCF went to post, pole, viga, latilla, log furniture, and excelsior manufacturers. The following conversion factors were used to convert Scribner board foot volume to cubic feet:

- 5.74 board feet per cubic foot for house logs;
- 5.25 board feet per cubic foot for sawlogs;
- 3.29 board foot per cubic foot for all other products.

Of the 11,408 MCF of timber received by sawmills, 5,162 MCF (45 percent) became finished lumber or other sawn products, and about 215 MCF was lost to shrinkage. The remaining 6,031 MCF (53 percent) became mill residue. About 5,955 MCF of sawmill residue was utilized, and about 76 MCF (1 percent) remained unused. Of the 1,190 MCF of timber received by log home manufacturers, about 672 MCF (56 percent) became house logs, while the remaining 518 MCF became mill residue. About 498 MCF of house log residue was utilized, and about 20 MCF remained unused. Of the 2,422 MCF of timber received by other manufacturers, nearly 1,996 MCF was utilized in solid wood products (such as posts, vigas, latillas, and log furniture) or was used in the production of excelsior. About 419 MCF of residues from these other sectors were utilized, and 7 MCF went unused.



^aOther plants include post, pole, viga, latilla, log furniture, and excelsior manufacturers.

Figure C1—Colorado timber harvest and flow, 2002.

Forest Industry Sectors

Colorado's primary forest products industry in 2002 consisted of 133 active manufacturers in 31 counties (table C9). Facilities tended to be located near the forest resource in the central and southwestern portions of the State (fig. C2). The sawmill sector, manufacturing lumber and other sawn products, was the largest sector operating in 2002 with 50 mills; 46 facilities produced house logs and log homes. There were 26 log furniture producers, 10 post and pole firms, and an excelsior producer also operating in 2002. McLain (1985) identified 95 primary wood-processing plants in 1982: 84 sawmills, five house log plants, four post and pole facilities, a shake mill, and an excelsior manufacturer. Changes in Colorado's industry structure over the past 20 years were similar to those experienced throughout the West, with the number of sawmills decreasing and the number and diversity of other manufacturers increasing (Keegan and others 2001 a,b; Morgan and others 2004 a,b; Morgan and others, in press).

Historic sales values for Colorado's primary wood products producers were not provided by Setzer (1971b), Setzer and Shupe (1977), or McLain (1985). In 2002, sales value of finished products from Colorado's primary wood products industry totaled \$96.0 million (table C10). Sales from sawmills accounted for 43 percent, house log and log home manufacturers accounted for 29 percent, and other products manufacturers accounted for about 28 percent of finished products sales.

Sawmill sector

The number of sawmills in Colorado decreased from 84 in 1982 (McLain 1985) to 50 in 2002 (table C11), with 11 sawmills closing between 1992 and 2000 (WWPA 2001). Total lumber production in the State dropped 30 percent from about 118 MMBF (WWPA 1983) to 83 MMBF in 2002, but average production per mill increased 21 percent from 1.4 MMBF to 1.7 MMBF. The State's 10 largest sawmills in 2002 produced an average of 6,791 MBF, and eight of these mills produced between 2,000 MBF and 5,000 MBF. The remaining 40 mills had an average lumber production of less than 400 MBF (table C12).

On average, Colorado sawmills produced approximately 1.47 board feet of lumber for every board foot Scribner of timber processed for an average overrun of 47 percent in 2002. Overrun was estimated to be 17 percent in 1982, using WWPA's (1983) lumber production and McLain's (1985) sawlog consumption. The 26 percent overrun increase was attributed to improved milling technology and the increased use of smaller diameter timber. Technological improvements have made Colorado mills more efficient. For example, thinner kerf saws reduce the proportion of the log that becomes sawdust. Additionally, mill-delivered log diameters are believed to have decreased over the past 20 years, with reduced old-growth harvesting and increased use of restoration and fuels treatments that favor retention of larger trees and the removal of smaller stems. As log diameters decrease, the Scribner log rule, which is used in Colorado, underestimates—by an increasing amount—the volume of lumber that can be recovered from a log, thus increasing overrun.

Sales from sawmills were low, accounting for just 43 percent (\$41.5 million) of Colorado timber processors' finished products sales in 2002. In contrast; sawmill sales accounted for 79 and 74 percent of timber processors' finished product sales in Arizona and New Mexico, respectively, during 2002, and historically accounted for 90 percent or more of sales throughout the Interior West (Keegan and others 2001a,b,c; Morgan and others 2004b). Dimension lumber and studs accounted for \$25.8 million (63 percent) of sawmill product sales in 2002; mine timbers, cants, and railroad ties accounted for \$8.4 million (20 percent); board and shop lumber accounted for \$4.7 million (11 percent); and other sawn products accounted for nearly \$2.6 million (6 percent) of finished product sales from sawmills.

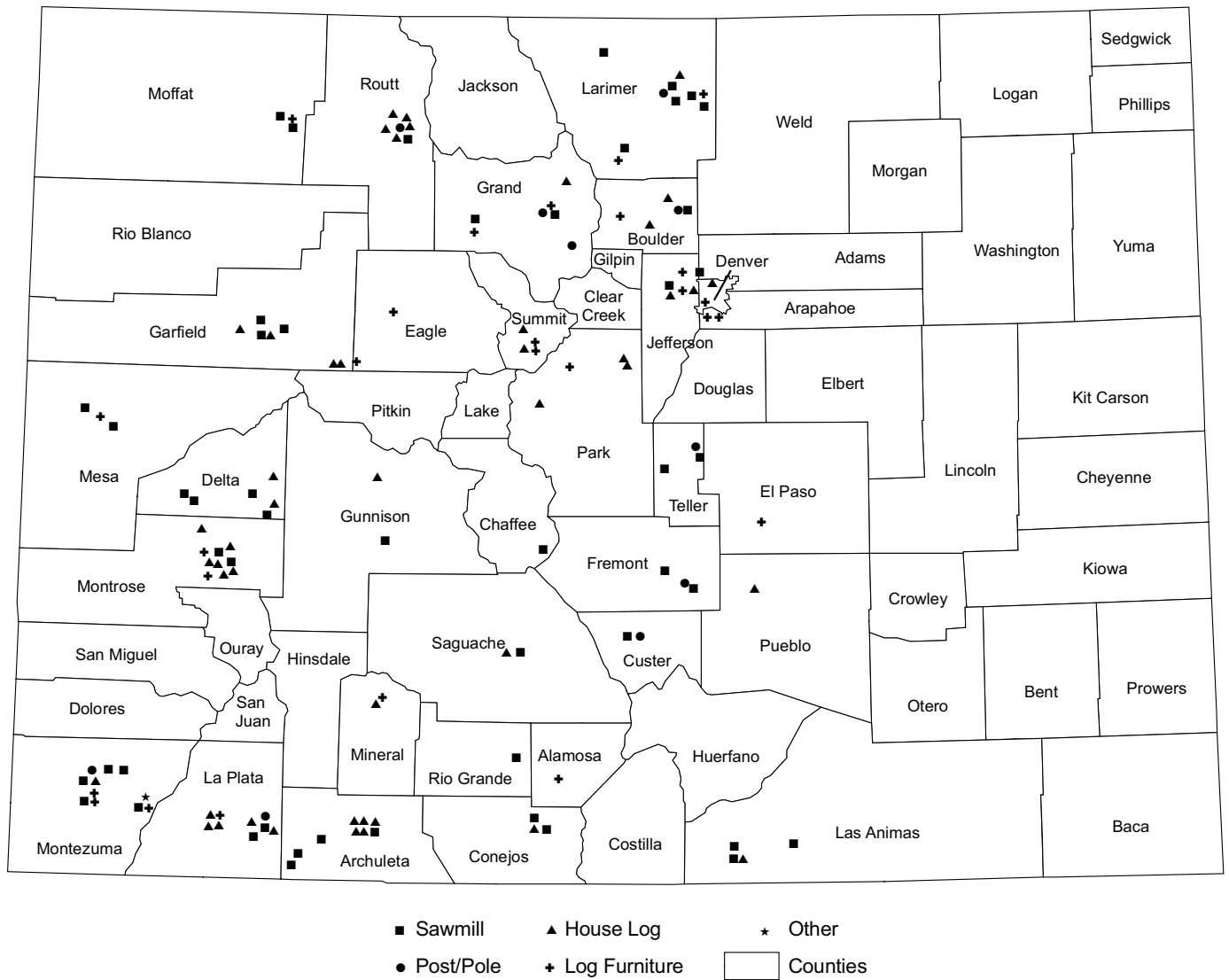


Figure C2—Colorado active primary timber processors, 2002.

Log home sector

Colorado's log home sector experienced substantial growth over the past 20 years. Forty-one more house log manufacturers were identified in 2002 than in 1982 (table C9). Only firms that processed timber and manufactured house logs or log homes, not log home distributors, were included in the 1982 and 2002 censuses. In 2002, Colorado's 46 log home manufacturers processed almost 9.6 MMBF Scribner of timber, produced about 2.7 million lineal feet (MMLF) of house logs, and generated almost \$28.0 million in product sales. By sales value, Colorado's log home industry is the third largest in the Western United States, behind Montana and Idaho.

Other products sectors

As with the log home sector, significant expansion occurred among Colorado's producers of posts and poles and other primary wood products, with 31 more facilities operating in 2002 than in 1982. Twenty-six of these other products producers in

2002 were log furniture manufacturers, 10 were log post and pole producers, and one was an excelsior plant. Finished products sales by manufacturers of posts and poles exceeded \$2.0 million, and sales by manufacturers of log furniture and excelsior exceeded \$24.4 million in 2002. Additional detail about the sector is withheld to protect the confidentiality of firm level information.

Capacity and Utilization

Colorado's annual sawmill production capacity was 235 MMBF of lumber in 2002. Producing 83.3 MMBF of lumber, sawmills utilized 35 percent of their lumber production capacity. This was an historically low level of production capacity utilization, suggesting that more sawmill closures can be expected in Colorado unless timber supply—the major factor impacting lumber production in the State—increases. Timber-processing capacity among Colorado sawmills was 146,188 MBF Scribner, with 56,843 MBF Scribner of timber processed, making utilization of timber-processing capacity among sawmills about 39 percent in 2002. Across all industry sectors, total timber-processing capacity was 172,930 MBF Scribner. Accounting for changes in mills' log inventories, a total of 77,264 MBF Scribner was processed by Colorado firms in 2002, making timber-processing capacity utilization about 45 percent across all sectors. The greater timber-processing capacity utilization of all sectors compared to sawmills would indicate that processors other than sawmills were operating near their total timber capacity and are better positioned to utilize the mix of timber being offered in Colorado.

Mill Residue Volumes, Types, and Uses

Sawmills, the leading timber processors, were also the main residue producers in Colorado. In 2002, sawmills produced 1.01 BDU of residue per MBF of lumber (table C13). Across all sectors, Colorado timber processors produced 94,945 BDU, approximately 9,115 MCF of mill residue, with 98.0 percent utilized (table C14). Total residue production declined from 22,749 MCF in 1974 and 12,420 MCF in 1982, while the proportion utilized increased from 40 percent in 1974 and 64 percent in 1982 (McLain 1985). Colorado's decreased residue production resulted from increased milling efficiencies in concert with decreased timber volumes processed. Increased residue utilization between 1974 and 2002 was attributable to decreased residue production and the evolution of better markets for residue-related products.

Coarse residue was the State's largest residue component at 42 percent (39,910 BDU) of all residues in 2002, with 98 percent utilized. Out-of-State pulp, paper, and reconstituted board facilities used 17,245 BDU of the coarse material, with the remaining utilized volume going to energy and unspecified uses (table C14). Fine residues comprised the second largest component at 30 percent (28,580 BDU) of mill residues. Almost 99 percent of fine residue was utilized in 2002, primarily as mulch or animal bedding, with about one-third of fine residues going to pulp, paper, and reconstituted board facilities. Bark accounted for 28 percent of all residues and was largely used for mulch or burned for energy in 2002, with 25,610 BDU (97 percent) utilized.

Primary Forest Products Markets and Sales

Sales from Colorado's primary wood products industry during 2002 totaled nearly \$98.6 million, including finished products and mill residues (table C15). Lumber, mine timbers, and other sawn products accounted for 41 percent (almost \$41 million) of total sales; house logs and log homes accounted for 28 percent (almost \$28 million);

while other products and mill residues accounted for 31 percent (nearly \$30 million). Colorado was the leading market area for lumber, log homes, posts, poles, and log furniture, with in-State sales accounting for almost 44 percent of total sales. The other Four Corners States (Arizona, New Mexico, and Utah) accounted for about 12 percent of total sales, with lumber and log homes playing significant roles. The South accounted for over 14 percent of total sales, 20 percent of lumber sales, and 13 percent of log home sales. The North Central States, Far West, and Northeast were major market areas for other products, including excelsior and mill residues.

Table C1—Colorado nonreserved timberland by ownership class.

Ownership class	Thousand acres	Percentage of nonreserved timberland
National Forest	8,953	65
Private	3,365	24
Other public	1,515	11
Total	13,834	100

Source: Benson and Green 1987.

Table C2—Colorado timber harvest by ownership class, 1982 and 2002 (source: McLain 1985).

Ownership class	1982		2002	
	MBF Scribner	Percentage of total	MBF Scribner	Percentage of total
Private and tribal timberland	14,814	14.3	45,723	57.4
Private	14,814	14.3	45,223	56.7
Tribal	—	0.0	500	0.6
Public timberland	88,618	85.7	33,989	42.6
National Forest	83,106	80.3	30,631	38.4
State lands	4,977	4.8	2,749	3.4
Other public	535	0.5	609	0.8
All owners	103,448	100	79,711	100

Table C3—Colorado timber products harvested by ownership class, 2002.

Ownership class	Sawlogs	Post and pole	House logs	Other products ^a	All products
-----Thousand board feet, Scribner-----					
Private timberland	36,651	823	1,817	5,933	45,223
National Forest	24,676	203	4,578	1,174	30,631
Other public lands	2,601	306	431	20	3,358
Tribal timberland	500	—	—	—	500
All owners	64,427	1,332	6,826	7,127	79,711
-----Percentage of harvested product by ownership-----					
Private timberland	56.9	61.8	26.6	83.2	56.7
National Forest	38.3	15.2	67.1	16.5	38.4
Other public lands	4.0	23.0	6.3	0.3	4.2
Tribal timberland	0.8	—	—	—	0.6
All owners	80.8	1.7	8.6	8.9	100

^aOther products include furniture logs, fiber logs, viga logs, and logs delivered to primary manufacturers that became firewood.

Table C4—Colorado timber harvest by county, selected years (sources: Setzer and Shupe 1977, McLain 1985).

County	1974	1982	2002	1974	1982	2002
	----- MBF Scribner -----			----- Percentage -----		
Adams	—	—	8	—	—	<0.05
Alamosa	397	800	—	0.2	0.8	—
Archuleta	24,856	300	1,640	11.6	0.3	2.1
Boulder	90	514	44	<0.05	0.5	0.1
Chaffee	—	252	595	—	0.2	0.7
Clear Creek	—	500	—	—	0.5	—
Conejos	6,007	1,221	740	2.8	1.2	0.9
Costilla	—	—	3,684	—	—	4.6
Custer	2,383	2,526	300	1.1	2.4	0.4
Delta	1,324	933	2,376	0.6	0.9	3.0
Dolores	12,687	7,801	5,907	5.9	7.5	7.4
Douglas	213	1,600	40	0.1	1.5	0.1
Eagle	5,221	1,500	200	2.4	1.5	0.3
Elbert	265	—	—	0.1	—	—
El Paso	285	470	240	0.1	0.5	0.3
Fremont	—	1,100	1,673	—	1.1	2.1
Garfield	2,218	500	9,321	1.0	0.5	11.7
Gilpin	—	—	20	—	—	<0.05
Grand	18,406	618	3,113	8.6	0.6	3.9
Gunnison	12,431	2,336	4,249	5.8	2.3	5.3
Huerfano	2,192	1,800	500	1.0	1.7	0.6
Jackson	20,786	16,273	4,373	9.7	15.7	5.5
Jefferson	—	1,881	361	—	1.8	0.5
La Plata	39,950	1,271	2,312	18.7	1.2	2.9
Lake	—	—	844	—	—	1.1
Larimer	5,219	2,497	3,145	2.4	2.4	3.9
Las Animas	993	1,600	7,057	0.5	1.5	8.9
Logan	33	—	—	<0.05	—	—
Mesa	5,252	1,765	8,660	2.5	1.7	10.9
Mineral	11,876	6,531	372	5.5	6.3	0.5
Moffat	158	—	124	0.1	—	0.2
Montezuma	4,169	15,001	4,495	1.9	14.5	5.6
Montrose	2,714	7,735	3,029	1.3	7.5	3.8
Ouray	—	2,565	30	—	2.5	<0.05
Park	252	2,456	4,369	0.1	2.4	5.5
Pitkin	331	—	—	0.2	—	—
Pueblo	176	—	306	0.1	—	0.4
Rio Blanco	370	10	730	0.2	<0.05	0.9
Rio Grande	10,857	9,277	557	5.1	9.0	0.7
Routt	10,442	1,976	1,143	4.9	1.9	1.4
Saguache	11,426	4,802	520	5.3	4.6	0.7
San Juan	—	—	274	—	—	0.3
San Miguel	—	2,131	1,020	—	2.1	1.3
Summit	—	193	289	—	0.2	0.4
Teller	46	713	1,049	<0.05	0.7	1.3
Total	214,025	103,448	79,711	100	100	100

Table C5—Colorado timber harvest by species, selected years (sources: Setzer and Shupe 1977; McLain 1985).

Species	1974	1982	2002	1974	1982	2002
	-----MBF Scribner-----			--- Percentage of harvest ---		
Ponderosa pine	34,306	22,716	22,526	16.0	22.0	28.3
Spruce ^a	91,638	41,877	19,908	42.8	40.5	25.0
Aspen and cottonwood	4,825	12,737	15,292	2.3	12.3	19.2
Lodgepole pine	42,187	15,500	12,457	19.7	15.0	15.6
Douglas-fir	26,927	6,574	6,959	12.6	6.4	8.7
True firs ^b	14,142	3,986	2,512	6.6	3.9	3.2
Other species ^c	—	58	58	—	0.1	0.1
All species	214,025	103,448	79,711	100	100	100

^aSpruce includes Engelmann and blue spruce.

^bTrue firs include white and subalpine fir.

^cOther species include juniper and hardwoods.

Table C6—Colorado timber harvest by species and product, 2002.

Species	Sawlogs	Post and pole	House logs	Other products ^a	All products
	----- Thousand board feet, Scribner -----				
Ponderosa pine	19,667	2,253	369	237	22,526
Spruce ^b	16,307	3,443	44	114	19,908
Aspen and cottonwood	8,683	32	20	6,557	15,292
Lodgepole pine	10,674	768	840	174	12,457
Douglas-fir	6,657	231	58	14	6,959
True firs ^c	2,400	99	—	14	2,512
Other species ^d	40	—	0	18	58
All species	64,427	6,826	1,332	7,127	79,711
	----- Percentage of product by species -----				
Ponderosa pine	30.5	33.0	27.7	3.3	28.3
Spruce ^b	25.3	50.4	3.3	1.6	25.0
Aspen and cottonwood	13.5	0.5	1.5	92.0	19.2
Lodgepole pine	16.6	11.2	63.1	2.4	15.6
Douglas-fir	10.3	3.4	4.4	0.2	8.7
True firs ^c	3.7	1.5	—	0.2	3.2
Other species ^d	0.1	—	0.0	0.2	0.1
All species	80.8	8.6	1.7	8.9	100

^aOther products include furniture logs, fiber logs, viga logs, and logs delivered to primary manufacturers that became firewood.

^bSpruce includes Engelmann and blue spruce.

^cTrue firs include white and subalpine fir.

^dOther species include juniper and hardwoods.

Table C7—Colorado timber products imports and exports, 2002.

Timber product	Imports	Exports	Net imports (Net exports)
----- Thousand board feet, Scribner -----			
Sawlogs	5,063	8,230	(3,167)
House logs	3,494	570	2,924
Other products ^a	3,088	92	2,996
All products	11,645	8,892	2,753

^aOther products include furniture logs, fiber logs, viga logs, and logs delivered to primary manufacturers that became firewood.

Table C8—Timber received by Colorado forest products industry by ownership class and product, 2002.

Ownership class	Sawlogs	Post and pole	House logs	Other products ^a	All products
----- Thousand board feet, Scribner -----					
Private and tribal timberland	40,303	893	2,295	8,757	52,247
Private	39,803	893	2,213	8,757	51,665
Tribal	500	—	83	—	583
Public timberland	20,958	599	6,351	1,206	29,114
National Forest	20,016	293	6,196	1,186	27,691
State lands	641	106	50	17	814
Other public	301	200	105	3	609
Other owners	—	—	1,103	—	1,103
Other mills	—	—	105	—	105
Canada	—	—	998	—	998
All owners	61,260	1,492	9,749	9,963	82,464
----- Percentage of product by owner -----					
Private and tribal timberland	65.8	59.8	23.5	87.9	63.4
Private	65.0	59.8	22.7	87.9	62.7
Tribal	0.8	—	0.8	—	0.7
Public timberland	34.2	40.2	65.1	12.1	35.3
National Forest	32.7	19.6	63.6	11.9	33.6
State lands	1.0	7.1	0.5	0.2	1.0
Other public	0.5	13.4	1.1	0.0	0.7
Other owners	—	—	11.3	—	1.3
Other mills	—	—	1.1	—	0.1
Canada	—	—	10.2	—	1.2
All owners	74.3	1.8	11.8	12.1	100

^aOther products include furniture logs, fiber logs, viga logs, and logs delivered to primary manufacturers that became firewood.

Table C9—Active Colorado primary wood products facilities by county and product, 2002 (source: McLain 1985).

County	Lumber	Log homes and house logs	Post and pole	Log furniture and other products ^a	Total
Alamosa				1	1
Arapahoe				2	2
Archuleta	4	5			9
Boulder	1	2	1	1	5
Chaffee	1				1
Conejos	2	1			3
Custer	1		1		2
Delta	4	2			6
Denver		1		1	2
Eagle				2	2
El Paso				1	1
Fremont	2		1		3
Garfield	3	4			7
Grand	2	1	2	2	7
Gunnison	1	1			2
Jefferson	2	2		2	6
La Plata	2	5	1	1	9
Larimer	6	1	1	2	10
Las Animas	3	1			4
Mesa	2			1	3
Mineral		1		1	2
Moffat	2			1	3
Montezuma	5	1	1	4	11
Montrose	2	6		2	10
Park		3		1	4
Pueblo		1			1
Rio Grande	1				1
Routt	1	5	1		7
Saguache	1	1			2
Summit		2		2	4
Teller	2		1		3
2002 Total	50	46	10	27	133
1982 Total	84	5	4	2	95

^aOther products include excelsior.

Table C10—Finished product sales of Colorado's primary wood products sectors, 2002.

Sector	Thousand 2002 dollars ^a
Sawmills	\$41,530
Log homes	27,991
Other sectors ^b	26,520
Total	\$96,041

^aAll sales are reported f.o.b. the manufacturer's plant.

^bOther sectors include producers of posts, poles, log furniture, and excelsior.

Table C11—Number of Colorado sawmills and average lumber production, selected years (sources: McLain 1985; WWPA 1983).

Year	Number of sawmills	Average lumber production
		<i>MMBF^a</i>
2002	50	1.7
1982	84	1.4 ^b

^aMMBF = million board feet lumber tally.

^bTotal production 118 MMBF.

Table C12—Colorado lumber production by mill size, 2002.

Size class ^a	Number of mills	Volume	Percentage of total	Average per mill
		<i>MBF^b</i>		<i>MBF^b</i>
Over 2 MMBF	10	67,905	82	6,791
Under 2 MMBF	40	15,408	18	385
Total	50	83,313	100	1,666

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table C13—Colorado sawmill residue factors, 2002.

Type of residue	BDU/MBF lumber tally ^a
Coarse	0.42
Sawdust	0.17
Planer shavings	0.13
Bark	0.29
Total	1.01

^aBone-dry unit (BDU = 2,400 lb oven-dry wood) of residue generated for every 1,000 board feet of lumber manufactured.

Table C14—Production and disposition of Colorado mill residues, 2002

Residue type	Total utilized	Pulp and board	Energy	Mulch/ bedding	Unspecified use	Unused	Total produced
----- <i>Bone-dry units^a</i> -----							
Coarse	39,239	17,245	14,490	—	7,504	671	39,910
Fine	28,178	9,153	—	19,025	—	402	28,580
Sawdust	14,580	3,105	—	11,475	—	230	14,810
Planer shavings	13,598	6,048	—	7,550	—	172	13,770
Bark	25,610	—	3,837	20,713	1,060	845	26,455
Total	93,027	26,398	18,327	39,738	8,564	1,918	94,945
----- <i>Percentage of residue type</i> -----							
Coarse	98.3	43.2	36.3	—	18.8	1.7	42.0
Fine	98.6	32.0	—	66.6	—	1.4	30.1
Sawdust	98.4	21.0	—	77.5	—	1.6	15.6
Planer shavings	98.8	43.9	—	54.8	—	1.2	14.5
Bark	96.8	—	14.5	78.3	4.0	3.2	27.9
Total	98.0	27.8	19.3	41.9	9.0	2.0	100

^aBone-dry unit = 2,400 lb oven-dry wood.

Table C15—Destination and sales value of Colorado's primary wood products and mill residues, 2002.

Product	Colorado	Other 4-Corner States	Other Rocky Mtn States	Far West ^a	Northeast ^b	South ^c	North Central ^d	Mexico, Canada, or other ^e	Total
----- <i>Thousand 2002 dollars</i> -----									
Lumber, mine timbers and other sawn products	\$16,155	\$4,523	\$8,568	\$1,341	—	\$8,201	\$1,837	—	\$40,623
House logs and log homes	18,854	3,181	936	22	389	3,695	915	—	27,992
Posts, poles, and log furniture	5,648	1,771	279	288	314	467	950	—	9,716
Other products ^f	2,358	2,032	—	3,528	3,528	1,764	5,292	1,764	20,266
Total	\$43,015	\$11,507	\$9,782	\$5,179	\$4,231	\$14,127	\$8,993	\$1,764	\$98,596
----- <i>Percentage of product sales by region</i> -----									
Lumber, mine timbers and other sawn products	39.8	11.1	21.1	3.3	—	20.2	4.5	—	41.2
House logs and log homes	67.4	11.4	3.3	0.1	1.4	13.2	3.3	—	28.4
Posts, poles, and log furniture	58.1	18.2	2.9	3.0	3.2	4.8	9.8	—	9.9
Other products ^f	11.6	10.0	—	17.4	17.4	8.7	26.1	8.7	20.6
Total	43.6	11.7	9.9	5.3	4.3	14.3	9.1	1.8	100

^a Far West includes Alaska, California, Hawaii, and Washington.

^b Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

^c South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

^d North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

^e Other includes European countries.

^f Other products include excelsior, firewood, and mill residues.

New Mexico

This chapter focuses on New Mexico's timber harvest and forest products industry during 2002, with discussion of changes that occurred since the 1997 industry census conducted by Keegan and others (2001b). Details of timber harvest, flow, and use are followed by descriptions of the primary processing sectors, capacity and utilization statistics, and mill residue characteristics. The chapter concludes with information on primary wood products industry sales by New Mexico mills.

Timber Harvest, Flow, and Use

In 2000, New Mexico had approximately 4.4 million acres of nonreserved timberland (O'Brien 2003), with National Forests accounting for 64 percent, private and tribal owners accounting for 33 percent, and other public agencies accounting for the remaining 3 percent (table N1). All private timberland was classified as NIPF timberland. With the exception of several Native American tribes, New Mexico had no large tracts of timberland owned by entities operating primary wood processing facilities. Sawtimber volume on nonreserved timberlands was estimated at 24.7 billion board feet Scribner in 2000 (O'Brien 2003).

Timber harvest

New Mexico's 2002 industrial timber harvest was 74.4 MMBF Scribner, 76 percent of the 1997 harvest, and 45 percent of the 1986 harvest (Keegan and others 2001b; McLain 1989). The decline in New Mexico's total annual timber harvest since the late 1980s was due to the decline of National Forest timber harvest. As National Forest and total timber harvest in the State declined, a disproportionate and diminishing share of New Mexico's timber harvest came from National Forest timberlands (table N2). In 1966, 1969, 1974, and 1986 National Forests accounted for 50 percent or more of harvested volume (Setzer and Wilson 1970; Setzer 1971c; Setzer and Barrett 1977; McLain 1989), whereas in 1997 and 2002 National Forests accounted for 12 and 14 percent of harvest volume, respectively (Keegan and others 2001b). Unlike other States in the region where National Forests provided the majority of house logs harvested, the majority of each of the timber products harvested in New Mexico came from private and tribal timberlands, and National Forests provided less than 20 percent of each product (table N3). Sawlogs accounted for almost 92 percent (68 MMBF) of the total volume harvested.

In 2002, as in 1997, Otero County led New Mexico's timber harvest with almost 42 percent of the volume; Rio Arriba and Mora Counties followed, with 24 and 15 percent, respectively (table N4). Otero County has accounted for an increasing share of New Mexico's timber harvest, with 7 percent in 1966, 10 percent in 1986, and 38 percent in 1997. Historically, Rio Arriba has been among the State's top three timber-producing counties, accounting for 15 percent or more of annual harvest volumes. Mora County, however, was not a significant contributor to New Mexico's annual harvest until 2002, accounting for less than 3 percent of harvest in previous censuses (Setzer and Wilson 1970; McLain 1989; Keegan and others 2001b).

Ponderosa pine continued to be the leading species harvested in New Mexico, accounting for nearly 51 percent of the harvest in 2002, and Douglas-fir retained its long-held position as the second most harvested species (table N5). White and subalpine firs and Engelmann spruce together accounted for about 25 percent of the 2002 harvest. Ponderosa pine was the leading species harvested for sawlogs, vigas, and house logs in 2002 (table N6). Douglas-fir, true firs, and Engelmann spruce were substantial

components of the sawlog harvest, while Engelmann spruce was the second largest component of house logs at 19 percent. Engelmann spruce, Douglas-fir, and true firs were also small components of the viga harvest. Aspen was the leading species harvested for other products, including posts, poles, furniture logs, and fiber logs.

Timber flow

The vast majority (92 percent) of New Mexico's 2002 timber harvest was processed in-State; however, New Mexico was a net exporter of timber. Almost 5.5 MMBF were exported for processing in Colorado, Idaho, and Wyoming, while a small amount of timber was imported from Colorado for processing in New Mexico (table N7).

Timber processors in New Mexico received 68,858 MBF of timber in 2002, including 290 MBF that was harvested outside the State. Timber receipts dropped nearly 25 percent since 1997, when New Mexico mills received 90,800 MBF of timber. Ownership sources of timber delivered to New Mexico mills changed slightly since 1997, with the proportion from private and tribal lands decreasing from 91 percent to 85 percent in 2002 (table N8). National Forests supplied timber to 10—less than a quarter—of New Mexico's mills in 2002, accounting for 15 percent of mill receipts, which was an increase from 1997 when National Forests supplied just 9 percent of the timber received by New Mexico mills. Unlike other States in the region, National Forests did not provide New Mexico forest products manufacturers with a majority portion of any timber products, supplying less than 20 percent of sawlogs and vigas, less than 10 percent of house logs, and just 5 percent of other products to the industry in 2002 (table N9).

Timber use

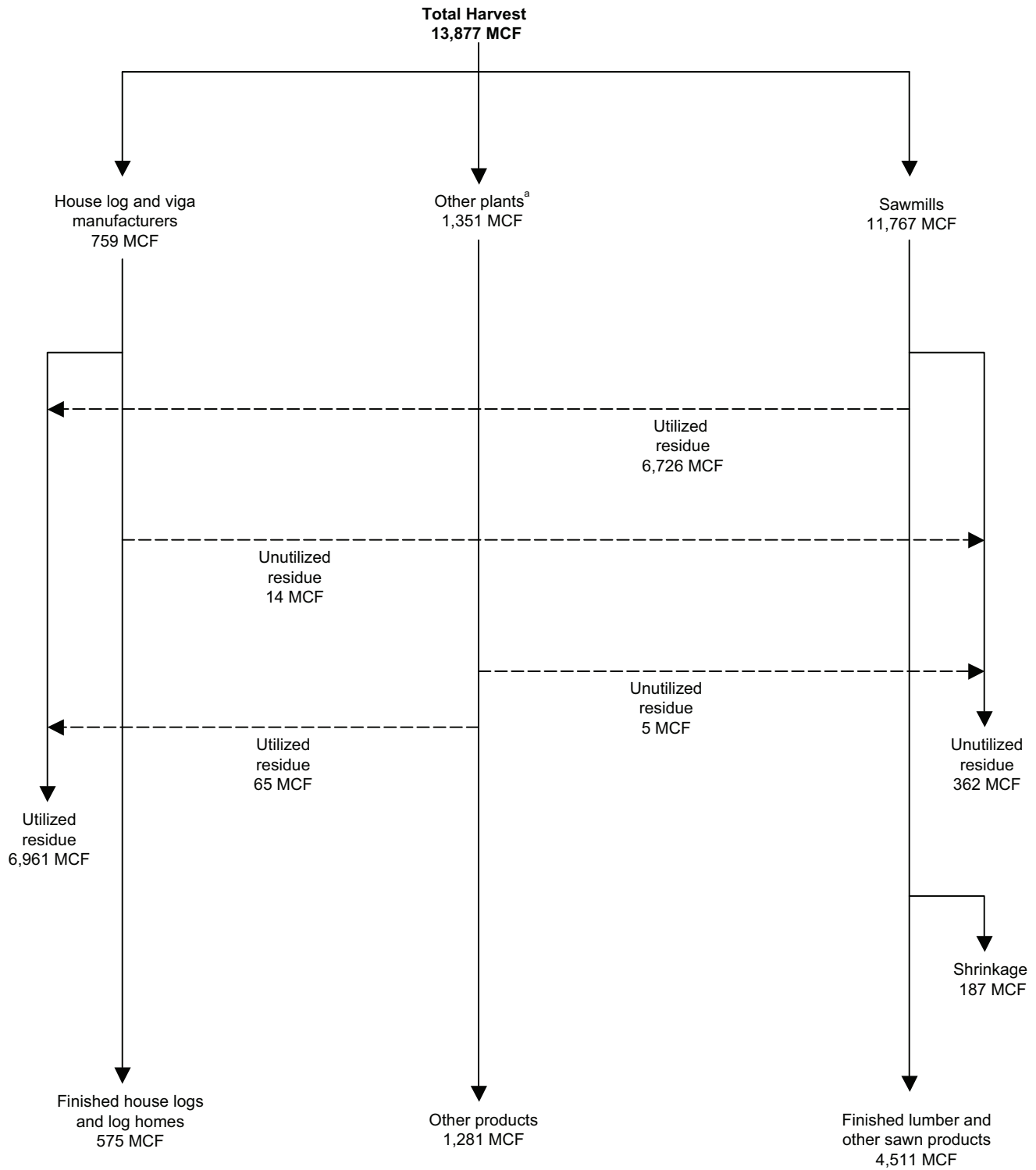
New Mexico's 2002 timber harvest—approximately 13,877 MCF, exclusive of bark (fig. N1)—was used by several manufacturing sectors both within and outside of New Mexico. Of this volume, 11,767 MCF went as logs to sawmills, 759 MCF went to log home and viga manufacturers, and 1,351 MCF went to other plants, including post, pole, latilla, log furniture, and excelsior manufacturers. The following conversion factors were used to convert Scribner board foot volume to cubic feet:

- 5.86 board feet per cubic foot for sawlogs;
- 5.23 board feet per cubic foot for house logs and vigas;
- 1.06 board foot per cubic foot for all other products.

Of the 11,767 MCF of timber received by sawmills, 4,511 MCF (38 percent) became finished lumber or other sawn products, and about 187 MCF was lost to shrinkage. The remaining 7,069 MCF (60 percent) became mill residue. About 6,726 MCF of sawmill residue was utilized, and about 343 MCF (5 percent) remained unused. Of the 759 MCF of timber received by log home and viga manufacturers, about 575 MCF (76 percent) became house logs, while the remaining 184 MCF became mill residue. About 170 MCF of house log residue was utilized, and about 14 MCF remained unused. Of the 1,351 MCF of timber received by other manufacturers, about 1,281 MCF was utilized in solid wood products such as posts, poles, latillas and log furniture, or was used in the production of excelsior. About 65 MCF of residues from these other sectors were utilized, and 5 MCF went unused.

Forest Industry Sectors

New Mexico's primary forest products industry in 2002 consisted of 36 active manufacturers in eight counties (table N10). Facilities tended to be located near the forest



^aOther plants include post, pole, latilla, log furniture, and excelsior manufacturers.

Figure N1—New Mexico timber harvest and flow, 2002.

resource in north-central New Mexico and in Otero County (fig. N2). The sawmill sector, manufacturing lumber and other sawn products, was the largest sector operating during 2002, with 21 facilities—one less mill than was operating in 1997. Eight facilities produced vigas and latillas, a decrease of seven since 1997. The number of other products manufacturers operating in 2002 remained at seven, with two post and pole manufacturers, two log home producers, two bark product facilities, and a log furniture producer. Keegan and others (2001b) noted that two particleboard plants and a medium density fiberboard (MDF) facility operated in New Mexico in 1986. One particleboard plant closed in the early 1990s, the MDF plant closed in 1996, and the particleboard facility operating in 1997 was determined to be inoperable in 2002 and was thus not included in the current analysis.

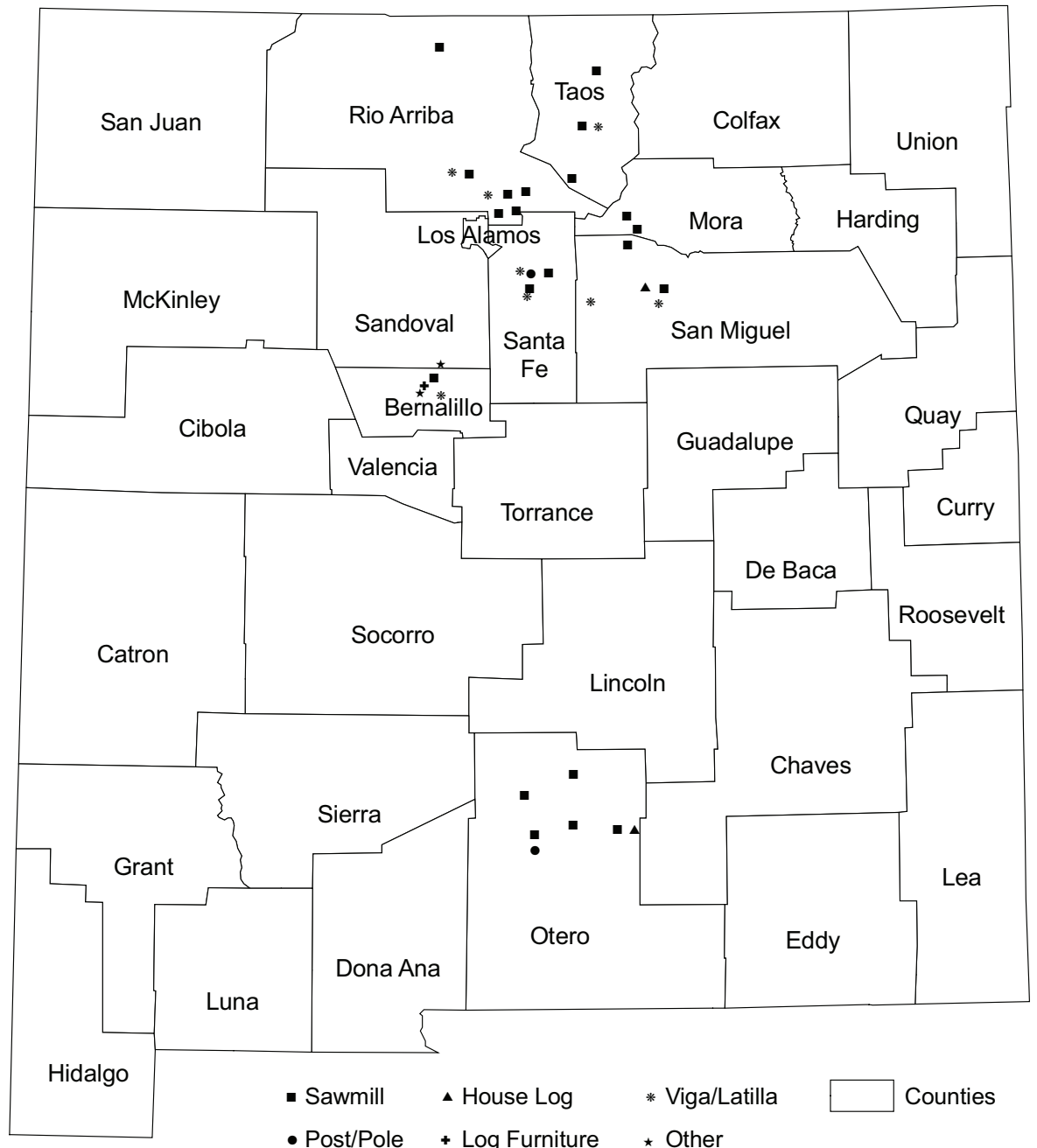


Figure N2—New Mexico active primary timber processors, 2002.

Primary wood products sales as well as the number of producers continued to decrease, with finished product sales in 2002 falling 26 percent since 1997 (table N11). The overall drop in sales was due to decreased sales in both the sawmill and the viga and latilla sectors. Among other products, sales increased 53 percent since 1997. In 1997 and in 2002, lumber accounted for 74 percent of total wood products sales. In 2002, sales from viga and latilla manufacturers accounted for just 10 percent of finished products sales versus nearly 20 percent of sales in 1997.

Sawmill sector

With the net loss of one sawmill since 1997, total lumber production in New Mexico dropped 25 percent from about 109 MMBF in 1997 to less than 82 MMBF in 2002, and shifted a larger proportion of the State's lumber production to mills producing less than 10 MMBF annually (table N12). Closure of that mill—one of the State's four largest in 1997—caused average annual lumber production to fall 20 percent from 4.9 MMBF to 3.9 MMBF per mill (table N13). In 2002, the State's seven largest sawmills produced an average of 11.0 MMBF, accounting for 95 percent of lumber production in New Mexico. The remaining 14 mills had an average annual lumber production of less than 350 MBF per mill (table N14). The continued declines in New Mexico's sawmill sector were a direct result of decreasing timber harvests in the State; however, the implementation of restoration and hazardous fuel reduction treatments in the State could spur a recovery of the sawmill sector (Fiedler and others 2002).

On average, New Mexico sawmills produced approximately 1.26 board feet of lumber for every board foot Scribner of timber processed, resulting in an average overrun of 26 percent in 2002. Overrun was 30 percent in 1997 (Keegan and others 2001b). The slight overrun decline was likely due to the increased proportion of lumber production by smaller mills, which typically are less efficient, use larger logs, and saw a larger proportion of mine timbers or board and shop lumber. In 2002, 78 percent of the lumber produced by New Mexico's sawmills was dimension and studs, 14 percent was board and shop lumber, and the remaining 8 percent consisted of mine timbers, decking, and dunnage. Dimension lumber accounted for \$26.8 million (78 percent) of sawmill product sales in 2002, board and shop lumber was about \$3.9 million (12 percent), and mine timbers, decking, and dunnage accounted for \$3.4 million (10 percent).

Viga and latilla sector

Substantial contraction occurred in New Mexico's viga and latilla sector between 1997 and 2002. Seven fewer viga and latilla manufacturers were identified in 2002 than in 1997, and sales dropped by more than \$6.4 million (58 percent). In 2002, the eight firms remaining in the sector processed 3,393 MBF Scribner of timber, versus 8,084 MBF processed in 1997 (Keegan and others 2001b). At just over 1 million lineal feet of vigas and latillas produced in 2002, production dropped substantially from 1997 when more than 2.2 million lineal feet were produced. The contraction of the sector in 2002 signaled the reversal of more than a decade of sector growth noted by Keegan and others (2001b). However, because of the part-time nature of many viga and latilla operations, the sector may again show increased production and sales if demand for traditional styles of construction increased and timber was available.

Other products sector

New Mexico's producers of other primary wood products grew with the addition of a log furniture manufacturer in 2002. Product sales by manufacturers of posts, poles, log homes, mulch, and log furniture exceeded \$7.7 million in 2002. Inflation-adjusted

sales from the sector were about \$5.1 million in 1997. Additional detail about the sector is withheld to protect the confidentiality of firm level information.

Capacity and Utilization

Across all industry sectors, total timber-processing capacity was 93,172 MBF Scribner. Accounting for changes in log inventories, a total of 68,758 MBF Scribner was processed by New Mexico firms in 2002, with total timber-processing capacity utilization about 74 percent. Sawtimber-processing capacity was 170,000 MBF Scribner in 1997, with 48 percent utilized (Keegan and others 2001b). In 2002, sawtimber-processing capacity fell to 88,162 MBF Scribner, with 65,116 MBF Scribner (74 percent) utilized. Decreased capacity and increased capacity utilization in the sawmill sector resulted from the permanent closure of one large sawmill, which was operating well below capacity in 1997. Another large New Mexico sawmill closed in 2003, driving capacity even lower. New Mexico's annual lumber production capacity was 118,700 MBF of lumber in 2002. Sawmills produced 81,515 MBF of lumber and utilized about 69 percent of their production capacity.

Mill Residue Volumes, Types, and Uses

In 1997, Arizona's lone paper mill and the particleboard plant in New Mexico were the largest consumers of mill residues that were generated in New Mexico. As previously indicated, the paper mill shifted to using recycled material and the particleboard plant closed, thus affecting residue utilization and other aspects of timber-processing in New Mexico and Arizona. Sawmills, New Mexico's leading timber processors, were the main residue producers in the State. Sawmills had to develop new markets for their residues, utilize more of the residues in-house, or consider cutting production to avoid generating more residue than could be disposed of affordably. The lack of outlets for mill residues also negatively impacted the ability of sawmills to process small-diameter timber (Fiedler and others 2002), which typically creates more residue per unit of lumber produced.

During 2002, New Mexico mills produced 95,001 BDU (approximately 9,120 MCF) of mill residue with 95.7 percent being utilized (table N15). Both residue production and the proportion utilized decreased from 1997, when New Mexico sawmills generated 12,572 MCF, utilizing 97.8 percent (Keegan and others 2001b). New Mexico's drop in residue utilization between 1997 and 2002 signaled a reversal of the long-term trend of increased residue utilization noted by Keegan and others (2001b) and was largely attributable to closure of the particleboard plant and changes at the Arizona paper mill. The decrease in total residue volume generated, however, was due to two factors: a substantially smaller volume of timber being processed and sawmills creating less residue per unit of lumber produced. In 1997, sawmills produced about 1.22 BDU per MBF of lumber; by 2002 that residue factor had dropped to 1.12 BDU per MBF of lumber (table N16).

Coarse residue was the State's largest residue component at 50.5 percent (48,001 BDU) of all residues in 2002, with 99 percent utilized. Out-of-State pulp and paper facilities used about 42,500 BDU of the coarse material, with the remaining utilized volume going to energy and unspecified uses (table N15). Fine residues—sawdust and planer shavings—comprised the second largest component at 29.6 percent (28,079 BDU) of mill residues. Only 87.7 percent of fine residue was utilized in 2002, primarily as mulch, animal bedding, or for other unspecified uses. Bark accounted for 19.9 percent of all residues and was largely used for mulch, with 18,550 BDU (98.0 percent) utilized in 2002.

Primary Forest Products Markets and Sales

Sales from New Mexico's primary wood products industry in 2002 totaled nearly \$47.7 million, including finished products and mill residues (table N17). Lumber, mine timbers, and other sawn products accounted for 72 percent (\$34.3 million) of total sales; vigas and latillas accounted for 9 percent (\$4.4 million); while other products and mill residues accounted for 19 percent (\$8.9 million). New Mexico was the leading market area for vigas, latillas, and other products, accounting for 80.6 percent of viga and latilla sales and 47.9 percent of other products sales. The other Four Corners States (Arizona, Colorado, and Utah) as well as New Mexico accounted for 47 percent of lumber sales, and the South accounted for more than 22 percent.

Table N1—New Mexico nonreserved timberland by ownership class (source: O'Brien 2003).

Ownership class	Thousand acres	Percentage of nonreserved timberland
National Forest	2,810	64
Private and tribal	1,448	33
Other public	146	3
Total	4,404	100

Table N2—New Mexico timber harvest by ownership class, 1997 and 2002 (source: Keegan and others 2001b).

Ownership class	1997		2002	
	MBF Scribner	Percentage of total	MBF Scribner	Percentage of total
Private and tribal timberland	85,903	88.0	64,201	86.3
Private	61,853	63.4	36,821	49.5
Tribal	24,050	24.6	27,380	36.8
Public timberland	11,723	12.0	10,160	13.7
National Forest	11,723	12.0	10,160	13.7
All owners	97,626	100	74,361	100

Table N3—New Mexico timber products harvested by ownership class, 2002.

Ownership class	Sawlogs	Vigas	House logs	Other products ^a	All products
----- <i>Thousand board feet, Scribner</i> -----					
Private timberland	31,507	2,742	690	1,882	36,821
Tribal timberland	27,130	—	—	250	27,380
National Forest	9,490	560	50	60	10,160
All owners	68,127	3,302	740	2,192	74,361
----- <i>Percentage of harvested product by ownership</i> -----					
Private timberland	46.2	83.0	93.2	85.9	49.5
Tribal timberland	39.8	—	—	11.4	36.8
National Forest	13.9	17.0	6.8	2.7	13.7
All owners	91.6	4.4	1.0	2.9	100

^aOther products include posts, poles, furniture logs, fiber logs, and logs delivered to primary manufacturers that became firewood.

Table N4—New Mexico timber harvest by county, selected years (sources: Setzer and Wilson 1970; McLain 1989; Keegan and others 2001b).

County	1966	1986	1997	2002	1966	1986	1997	2002
	----- <i>MBF Scribner</i> -----				----- <i>Percentage</i> -----			
Bernalillo	691	—	490	100	0.3	—	0.5	0.1
Catron	25,588	29,494	2,973	250	10.6	17.7	3.0	0.3
Cibola	—	13,857	7,973	15	—	8.3	8.2	<0.05
Colfax	32,853	4,000	18,450	3,777	13.6	2.4	18.9	5.1
Eddy	—	548	—	—	—	0.3	—	—
Grant	538	663	—	—	0.2	0.4	—	—
Lincoln	—	1,450	198	—	—	0.9	0.2	—
Los Alamos	54	—	—	—	<0.05	—	—	—
McKinley	36,692	—	2,000	—	15.1	—	2.0	—
Mora	957	3,830	2,040	10,864	0.4	2.3	2.1	14.6
Otero	17,335	16,982	36,866	30,825	7.2	10.2	37.8	41.5
Rio Arriba	37,156	69,367	17,107	17,869	15.3	41.7	17.5	24.0
San Juan	—	8,159	500	—	—	4.9	0.5	—
San Miguel	9,140	2,075	2,259	8,100	3.8	1.2	2.3	10.9
Sandoval	66,619	5,932	4,360	1,200	27.5	3.6	4.5	1.6
Santa Fe	—	2,865	—	670	—	1.7	—	0.9
Socorro	2,739	—	1,025	220	1.1	—	1.0	0.3
Taos	6,767	7,066	1,245	175	2.8	4.2	1.3	0.2
Torrance	—	—	120	175	—	—	0.1	0.2
Valencia	4,548	—	20	120	1.9	—	<0.05	0.2
Total ^a	242,313	166,342	97,626	74,361	100	100	100	100

^aPercentage detail may not sum to 100% due to rounding.

Table N5—New Mexico timber harvest by species, selected years.

Species	1966	1986	1997	2002
	----- <i>Percentage of harvest</i> -----			
Ponderosa pine	49	68	57	50
Douglas-fir	17	16	26	22
True firs ^a	5	9	11	16
Engelmann spruce	14	3	7	10
Other species ^b	15	4	< 0.5	2
All species	100	100	100	100

^aTrue firs include white and subalpine fir.

^bOther species include limber pine and aspen.

Sources: Setzer and Wilson 1970; McLain 1989; Keegan and others 2001b.

Table N6—New Mexico timber harvest by species and product, 2002.

Species	Sawlogs	Vigas	House logs	Other products ^a	All products
<i>----- Thousand board feet, Scribner -----</i>					
Ponderosa pine	33,520	2,784	558	693	37,555
Douglas-fir	16,250	194	—	276	16,720
True firs ^b	11,423	32	40	170	11,664
Engelmann spruce	6,856	293	142	1	7,291
Other species ^c	79	—	—	1,052	1,131
All species	68,127	3,302	740	2,192	74,361
<i>----- Percentage of product by species -----</i>					
Ponderosa pine	49.2	84.3	75.4	31.6	50.5
Douglas-fir	23.9	5.9	—	12.6	22.5
True firs ^b	16.8	1.0	5.4	7.7	15.7
Engelmann spruce	10.1	8.9	19.2	0.1	9.8
Other species ^c	0.1	—	—	48.0	1.5
All species	91.6	4.4	1.0	2.9	100

^aOther products include posts, poles, furniture logs, fiber logs, and logs delivered to primary manufacturers that became firewood.

^bTrue firs include white and subalpine fir.

^cOther species include limber pine and aspen.

Table N7—New Mexico timber products imports and exports, 2002.

Timber product	Imports	Exports	Net imports (Net exports)
<i>----- Thousand board feet, Scribner -----</i>			
Sawlogs	200	4,611	(4,411)
House logs	—	130	(130)
Other products ^a	90	1,052	(962)
All products	290	5,793	(5,503)

^aOther products include posts, poles, furniture logs, fiber logs, and logs delivered to primary manufacturers that became firewood.

Table N8—Ownership of timber products received by New Mexico mills, 1997 and 2002.

Ownership class	1997		2002	
	MBF Scribner	Percentage of total	MBF Scribner	Percentage of total
Private and tribal timberland	82,238	90.6	58,698	85.2
Private	57,788	63.6	31,318	45.5
Tribal	24,450	26.9	27,380	39.8
National Forests	8,562	9.4	10,160	14.8
All owners	90,800	100	68,858	100

Table N9—Timber received by New Mexico forest products industry by ownership class and product, 2002.

Ownership class	Sawlogs	Vigas	House logs	Other products ^a	All products
-----Thousand board feet, Scribner-----					
Private timberland	27,096	2,832	560	830	31,318
Tribal timberland	27,130	—	—	250	27,380
National Forest	9,490	560	50	60	10,160
All owners	63,716	3,393	610	1,140	68,858
-----Percentage of product by owner-----					
Private timberland	42.5	83.5	91.8	72.8	45.5
Tribal timberland	42.6	—	—	21.9	39.8
National Forest	14.9	16.5	8.2	5.3	14.8
All owners	92.5	4.9	0.9	1.7	100

^aOther products include posts, poles, furniture logs, fiber logs, and logs delivered to primary manufacturers that became firewood.

Table N10—Active New Mexico primary wood products facilities by county and product, 2002.

County	Lumber	Vigas and latillas	Other	Total
Bernalillo	1	1	2	4
Mora	2			2
Otero	5		2	7
Rio Arriba	6	2		8
San Miguel	2	2	1	5
Sandoval			1	1
Santa Fe	2	2	1	5
Taos	3	1		4
2002 Total	21	8	7	36
1997 Total	22	15	7	44
1986 Total	26	5–10	10	41–46

^aOther products include posts, poles, log homes, log furniture, and bark products.

Sources: McLain 1989, Keegan and others 2001b.

Table N11—Finished product sales of New Mexico's primary wood products, selected years (sources: McLain 1989; Miller Freeman, Inc. 1998; Keegan and others 2001b).

Product	1986	1997	2002
-----Thousand 2002 dollars-----			
Lumber and sawn products	\$101,095	\$46,747	\$34,268
Vigas and latillas	3,919	11,048	4,598
Other products ^a	4,898	5,055	7,747
Total ^b	\$109,912	\$62,850	\$46,614

^aOther products include posts, poles, log homes, log furniture, and bark products.

^bAll sales are reported f.o.b. the manufacturer's plant.

Table N12—New Mexico sawmills by production size class, selected years (sources: Setzer and Wilson 1970; McLain 1989; Keegan and others 2001b).

Year	Under 10 MMBF ^a	Over 10 MMBF ^a	Total
<i>----- Number of Sawmills -----</i>			
2002	18	3	21
1997	18	4	22
1986	17	9	26
1966	58	6	64
1962	85	c	85
1960	117	c	117
<i>-----</i>			
	<i>Percentage of lumber output</i>		<i>Volume (MBF^b)</i>
2002	12	88	81,515
1997	10	90	108,675
1986	12	88	232,000
1966	38	62	262,848
1962	c	c	242,500
1960	c	c	224,400

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

^cIn 1960 and 1962 all mills were included in <10 MMBF to avoid disclosing individual operations.

Table N13—Number of New Mexico sawmills and average lumber production, selected years (sources: McLain 1989; Setzer and Wilson 1970; Keegan and others 2001b).

Year	Number of sawmills	Average production per mill
<i>MMBF^a</i>		
2002	21	3.9
1997	22	4.9
1986	25	9.2
1966	64	4.1
1962	85	2.9
1960	117	1.9

^aMMBF = million board feet lumber tally.

Table N14—New Mexico lumber production by mill size, 2002.

Size class ^a	Number of mills	Volume	Percentage of total	Average per mill
		<i>MBF^b</i>		<i>MBF^b</i>
Over 1 MMBF	7	77,120	95	11,017
Under 1 MMBF	14	4,395	5	314
Total	21	81,515	100	3,882

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table N15—Production and disposition of New Mexico mill residues, 2002.

Residue type	Total utilized	Pulp and board	Energy	Mulch/ bedding	Unspecified use	Unused	Total produced
	----- <i>Bone-dry units^a</i> -----						
Coarse	47,730	42,532	2,850	—	2,348	271	48,001
Fine	24,636	5,800	3,528	9,608	5,700	3,443	28,079
Sawdust	12,757	—	3,528	9,229	—	3,443	16,200
Planer shavings	11,879	5,800	—	379	5,700	—	11,879
Bark	18,550	—	884	17,666	—	371	18,921
Total	90,916	48,332	7,262	27,274	8,048	4,085	95,001
	----- <i>Percentage of residue type</i> -----						
Coarse	99.4	88.6	5.9	—	4.9	0.6	50.5
Fine	87.7	20.7	12.6	34.2	20.3	12.3	29.6
Sawdust	78.7	—	21.8	57.0	—	21.3	17.1
Planer shavings	100.0	48.8	—	3.2	48.0	—	12.5
Bark	98.0	—	4.7	93.4	—	2.0	19.9
Total	95.7	50.9	7.6	28.7	8.5	4.3	100.0

^aBone-dry unit = 2,400 lb oven-dry wood.

Table N16—New Mexico sawmill residue factors, 1997 and 2002 (source: Keegan and others 2001b).

Type of residue	1997	2002
	<i>BDU/MBF lumber tally^a</i>	
Coarse	0.52	0.56
Sawdust	0.29	0.20
Planer shavings	0.18	0.15
Bark	0.23	0.21
Total	1.22	1.12

^aBone-dry unit (BDU = 2,400 lb oven-dry wood) of residue generated for every 1,000 board feet of lumber manufactured.

Table N17—Destination and sales value of New Mexico's primary wood products and mill residues, 2002.

Product	New Mexico	Other 4-Corner States	Other Rocky Mtn States	Far West ^a	Northeast ^b	South ^c	North Central ^d	Mexico, Canada, or other ^e	Total
----- <i>Thousand 2002 dollars</i> -----									
Lumber, mine timbers and other sawn products	\$7,930	\$8,179	\$1,760	\$5,200	—	\$7,764	\$2,296	\$1,139	\$34,268
Vigas and latillas	3,565	833	—	25	—	—	—	—	4,423
Other products ^f	4,299	3,386	50	206	—	570	50	417	8,979
Total	\$15,795	\$12,398	\$1,810	\$5,431	—	\$8,334	\$2,346	1\$,556\$	\$47,670
----- <i>Percentage of product sales by region</i> -----									
Lumber, mine timbers and other sawn products	23.1	23.9	5.1	15.2	—	22.7	6.7	3.3	71.9
Vigas and latillas	80.6	18.8	—	0.6	—	—	—	—	9.3
Other products ^f	47.9	37.7	0.6	2.3	—	6.3	0.6	4.6	18.8
Total	33.1	26.0	3.8	11.4	—	17.5	4.9	3.3	100.0

^a Far West includes Alaska, California, Hawaii, and Washington.

^b Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

^c South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

^d North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

^e Other includes European countries.

^f Other products include posts, poles, log homes, log furniture, bark products, firewood, and mill residues.

Utah

This chapter focuses on Utah's timber harvest and forest products industry during 2002. Details of timber harvest, flow, and use are followed by descriptions of the primary processing sectors, capacity and utilization statistics, and mill residue characteristics. The chapter concludes with information on primary wood products industry sales by Utah mills. Comparisons to previous years are provided where possible. Limited historical information is available about timber harvesting and mill production and residues in Utah. The last comprehensive study of the State's industrial roundwood production and mill residues was conducted in 1992 (Keegan and others 1995), and data for previous years include 1966 (Setzer and Wilson 1970), 1969 (Setzer 1971d), 1970 (Green and Setzer 1974), and 1974 (Setzer and Throssell 1977b).

Timber Harvest, Flow, and Use

In 1993, Utah had approximately 4.9 million acres of nonreserved timberland (O'Brien 1999), with National Forests accounting for 69 percent, private and tribal owners accounting for 20 percent, and other public agencies accounting for the remaining 12 percent (table U1). All private timberland was classified as NIPF timberland. Utah had no large tracts of timberland owned by entities operating primary wood processing facilities. Sawtimber volume on nonreserved timberlands was estimated at 22.5 billion board feet Scribner in 1993 (O'Brien 1999).

Timber harvest

Utah's 2002 industrial timber harvest was 41.3 MMBF Scribner (table U2), 36 percent less than the 1992 harvest of approximately 65 MMBF Scribner (Keegan and others 1995), and 34 percent less than the 1974 harvest of 62 MMBF (Setzer and Throssell 1977b). The decrease in Utah's total annual timber harvest since 1992 was due to the decline in National Forest timber harvest. In 1966 and 1970, National Forests accounted for 94 and 88 percent, respectively, of harvested volume (Setzer and Wilson 1970, Green and Setzer 1974). In 1992, National Forest timber accounted for almost 50.0 MMBF (77 percent) of the annual harvest (Keegan and others 1995), whereas in 2002 the agency provided just 23.8 MMBF (58 percent). As in most of the Western States, decreasing Federal timber harvests have led to greater shares of annual timber harvest coming from other ownership sources. National Forests still provide the majority of the State's harvest, but the volume and proportionate share supplied by private and tribal owners continues to increase. During 2002, private and tribal landowners accounted for 39 percent (16.2 MMBF) of Utah's timber harvest, versus about 23 percent in 1992. National Forests provided the majority (83 percent) of house logs harvested in 2002, but among sawlogs and other products (e.g., furniture logs, fiber logs, posts, poles, and industrial fuelwood) private timberlands and National Forests were evenly split—each providing slightly less than 50 percent (table U2). Sawlogs accounted for about 61 percent (25 MMBF) of the total volume harvested in 2002, house logs were 28 percent, and other products accounted for about 11 percent.

In 2002, Kane County led Utah's timber harvest, with 13 percent (5.5 MMBF Scribner) of the volume; Summit and Wasatch Counties followed with 10 and 9 percent, respectively (table U3). In 1992, Uintah and Summit Counties led the harvest with 16.6 MMBF (26 percent) and 10.0 MMBF (16 percent) of the harvest, respectively (Keegan and others 1995).

Spruces, including Engelmann and blue spruce, were the leading species harvested in Utah, accounting for 44 percent (18.1 MMBF) of the harvest in 2002 (table U4).

Lodgepole pine accounted for 23 percent, ponderosa for 13 percent, while aspen and cottonwood accounted for 10 percent. In 1992, lodgepole was the leading species harvested, accounting for 46 percent, while spruces accounted for 35 percent (Keegan and others 1995). During the 1960s and 1970s, ponderosa pine was the leading species harvested, accounting for 30 to 50 percent of the harvest; while lodgepole pine and spruces each accounted for 15 to 25 percent (Setzer and Wilson 1970; Setzer 1971d; Green and Setzer 1974; Setzer and Throssell 1977b).

Spruces were the leading species harvested for sawlogs and houselogs in 2002, accounting for 11.5 and 6.2 MMBF (45 and 53 percent), respectively (table U5). Lodgepole pine was also a significant component of house logs (35 percent) and of other products (40 percent). Aspen and cottonwood accounted for slightly less than 2.0 MMBF (46 percent) of the volume harvested for other products.

Timber flow

The majority (72 percent) of Utah's 2002 timber harvest was processed in-State; however, Utah was a net exporter of almost 8.8 MMBF of timber. About 11.6 MMBF were exported for processing in Colorado, Wyoming, Idaho, and Arizona; while 2.8 MMBF were imported for processing in Utah from Arizona, Colorado, Idaho, Montana, Wyoming, and as far away as Oregon and Canada (table U6).

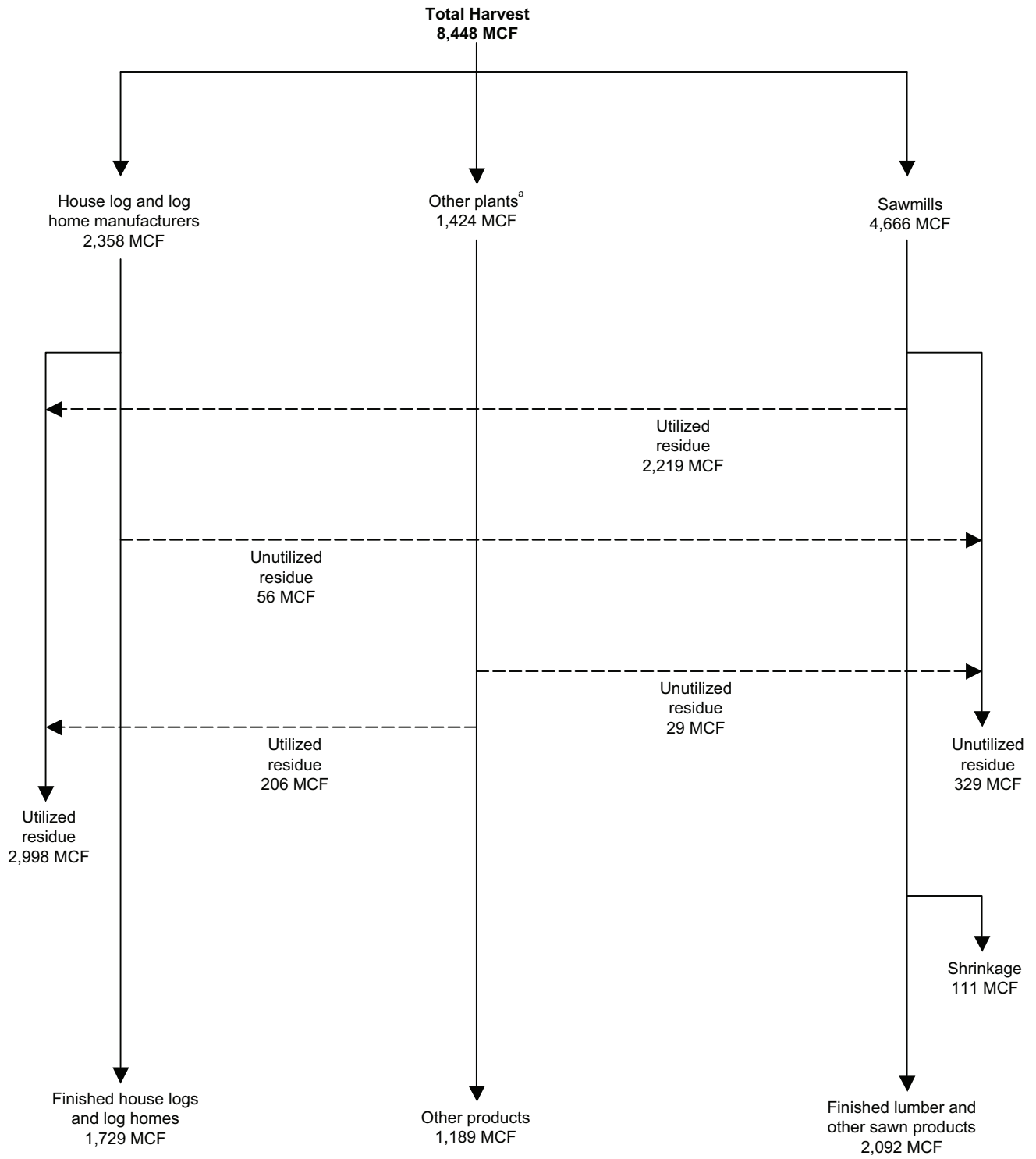
Timber processors in Utah received 32,518 MBF of timber in 2002, including 2,830 MBF that was harvested outside the State. Private and tribal timberlands provided 9,241 MBF (28 percent) of the timber delivered to Utah mills in 2002 (table U7). National Forests provided 67 percent (21,898 MBF) of timber receipts, with more than half (29) of Utah's timber processors receiving timber cut from National Forests. In 1992, Utah mills received 81 percent more timber. National Forests supplied 79 percent (46,595 MBF) of the timber in 1992, and private and tribal owners supplied 19 percent (11,341 MBF). During 2002, National Forests provided Utah timber processors with 87 percent of house logs, 57 percent of sawlogs, and 70 percent of other timber products including fiber logs, furniture logs, industrial fuelwood, posts, and poles (table U8). NIPF and tribal landowners provided 38 percent of sawlogs, 10 percent of houselogs, and 27 percent of other timber products. State lands provided less than 5 percent of the timber received by mills in Utah.

Timber use

Utah's 2002 timber harvest—approximately 8,448 MCF, exclusive of bark (fig. U1)—was used by several manufacturing sectors both within and outside of Utah. Of this volume, 4,666 MCF went as logs to sawmills, 2,358 MCF went to log home manufacturers, and 1,424 MCF went to other plants, including post, pole, log furniture, and excelsior manufacturers. The following conversion factors were used to convert Scribner board foot volume to cubic feet:

- 5.54 board feet per cubic foot for house logs;
- 5.42 board feet per cubic foot for sawlogs;
- 2.05 board foot per cubic foot for all other products.

Of the 4,666 MCF of timber received by sawmills, 2,092 MCF (45 percent) became finished lumber or other sawn products, and about 111 MCF was lost to shrinkage. The remaining 2,463 MCF (53 percent) became mill residue. About 2,219 MCF of sawmill residue was utilized, and about 244 MCF (10 percent) remained unused. Of the 2,358 MCF of timber received by log home manufacturers, about 1,729 MCF (73 percent) became house logs, while the remaining 629 MCF became mill residue. About 573 MCF of house log residue was utilized, and about 56 MCF remained unused. Of the



^aOther plants include post, pole, log furniture, and excelsior manufacturers.

Figure U1—Utah timber harvest and flow, 2002.

1,424 MCF of timber received by other manufacturers, about 1,189 MCF was utilized in solid wood products such as posts, poles, latillas, and log furniture, or was used in the production of excelsior. About 206 MCF of residues from these other sectors were utilized, and 29 MCF went unused.

Forest Industry Sectors

Utah's primary forest products industry in 2002 consisted of 49 active manufacturers in 20 counties (table U9). Facilities tended to be located near the forest resource along the mountainous central spine of the State (fig. U2). Changes in Utah's industry structure over the past 20 years were similar to those experienced throughout the West, with the number of sawmills decreasing and the number and diversity of other manufacturers increasing (Keegan and others 1995, 2001 a,b; Morgan and others 2004 a,b; Morgan and others 2005). The sawmill sector, manufacturing lumber and other sawn products, was the largest sector, operating 23 mills in 2002; 14 facilities produced house logs and log homes. There were 10 log furniture producers, one post and pole firm, and a decorative bark producer also operating in 2002. Keegan and others (1995) identified 51 primary wood-processing plants in 1992, including 34 sawmills, 13 house log plants, three post and pole facilities, and a roundwood furniture manufacturer. In 1966 there were 50 active sawmills in the State (Setzer and Wilson 1970).

Although the number of producers decreased, primary wood products sales increased slightly between 1992 and 2002. Finished product sales (\$34.2 million) in 2002 were about 4 percent higher than 1992 sales, adjusted for inflation (table U10). The overall sales increase occurred despite a substantial decline in lumber sales and was due to greatly increased sales of log homes and other products. Sales by log home manufacturers increased more than \$10 million and sales of other products increased by about \$2 million over the 1992 totals. In 2002, lumber sales accounted for less than 40 percent of finished product sales, versus 73 percent in 1992, while house logs and log homes accounted for more than 50 percent of sales in 2002, versus 25 percent in 1992.

Sawmill sector

Utah's sawmill sector has been in decline for several decades. Lumber production in 2002 was 58 percent lower than in 1992 and 63 percent lower than in 1966, while the number of mills declined 32 and 54 percent over the same periods (table U11). Most of the production loss was among the State's larger mills that produced more than 1 MMBF of lumber annually, while the greatest loss of actual milling facilities was among the small mills. The proportion of lumber production by large versus small mills has remained fairly consistent, but average annual lumber production per mill has dropped to its lowest level since the 1960s (table U12). Average annual lumber production among the State's six largest mills was about 3.8 MMBF lumber tally in 2002 (table U13), compared to almost 6.2 MMBF among nine mills in 1992. The remaining 17 small mills had an average lumber production of 204 MBF in 2002, compared to the 1992 average production of 318 MBF at 25 small mills (Keegan and others 1995).

On average, Utah sawmills produced approximately 1.28 board feet of lumber for every board foot Scribner of timber processed, resulting in an average overrun of 28 percent in 2002. Overrun was 26 percent in 1992 (Keegan and others 1995). The absence of a substantial change in overrun over the past 10 years indicates that few sawmills in Utah invested in improved milling technology.

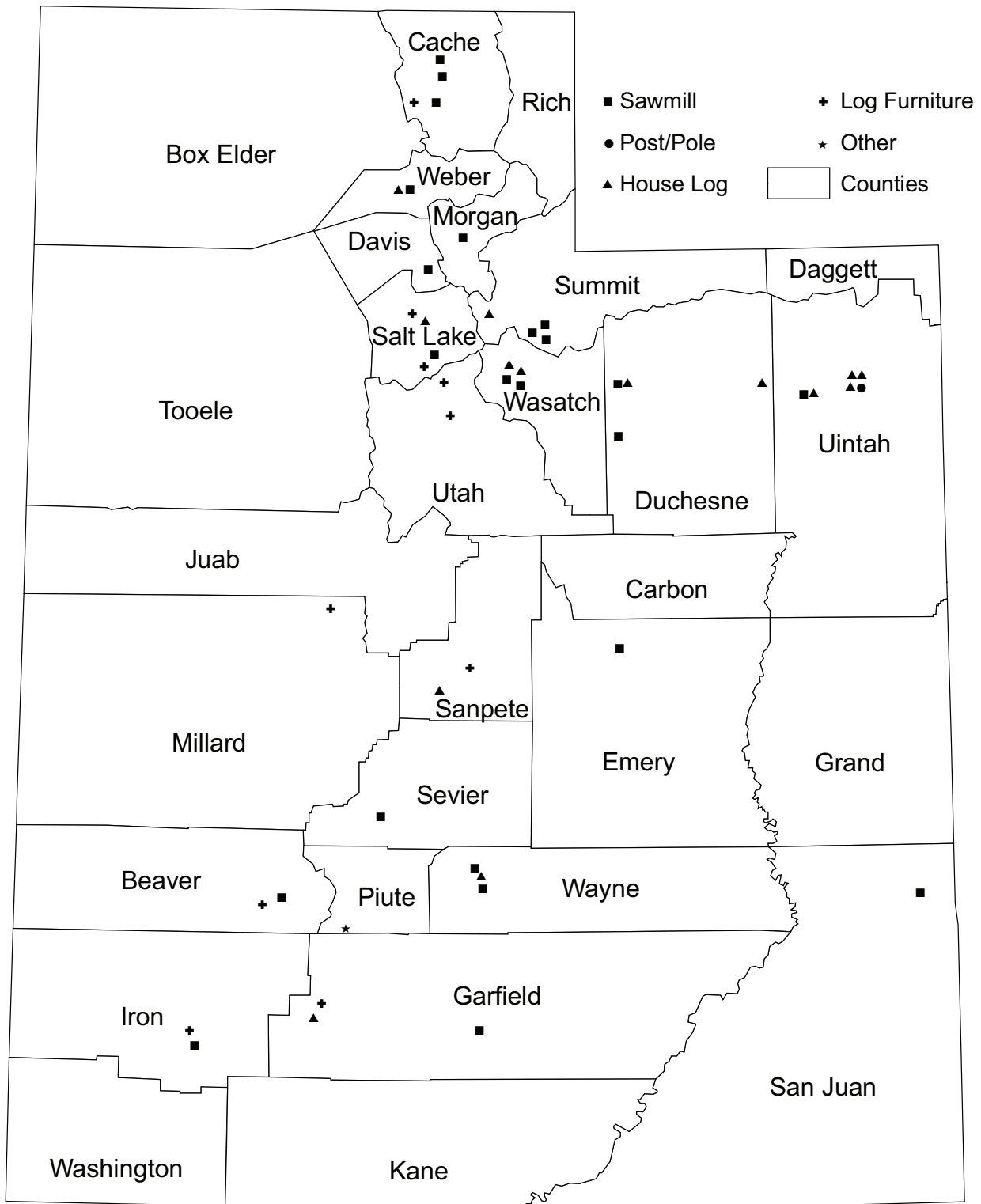


Figure U2—Utah active primary timber processors, 2002.

Sales from sawmills accounted for just 38 percent (\$12.8 million) of Utah timber processors' finished products sales in 2002. This proportion of sales from sawmills was the smallest of the Four Corners States. Sales from sawmills accounted for more than 70 percent of sales in Arizona and New Mexico and more than 40 percent in Colorado during 2002. Board and shop lumber accounted for almost \$5.0 million (40 percent) of sawmill product sales in 2002; mine timbers, cants, and railroad ties accounted for \$4.4 million (34 percent); dimension lumber and studs accounted for almost \$1.5 million (12 percent), and other sawn products accounted for \$1.9 million (14 percent) of finished product sales from sawmills.

Log home sector

Sales value from Utah's log home sector increased substantially over the past 10 years even though only one more house log manufacturer was identified in 2002 than in 1992. Only firms that processed timber and manufactured house logs or log homes, not log home distributors, were included in the 1992 and 2002 censuses. In 2002, Utah's 14 log home manufacturers processed 11.0 MMBF of timber, produced about 3.0 MMLF of house logs, and generated about \$18.5 million in product sales. By sales value, Utah's log home sector is the fourth largest in the Western United States, behind Montana, Idaho, and Colorado.

Other products sectors

As with Colorado, significant expansion occurred among Utah's other products sectors, with three times as many facilities operating in 2002 than in 1992. Ten of these other products producers in 2002 were log furniture manufacturers, one was a post and pole producer, and one was a decorative bark facility. Sales of posts, poles, and log furniture totaled almost \$2.9 million in 2002. Additional detail about the sector is again withheld to protect the confidentiality of firm level information.

Capacity and Utilization

Utah's annual sawmill production capacity was 77.5 MMBF of lumber in 2002. Sawmills produced 26.5 MMBF of lumber and utilized 34 percent of their lumber production capacity. This was an historically low level of production capacity utilization for Utah mills, as well as the lowest level of production capacity utilization for all the Four Corners States in 2002. Timber-processing capacity among Utah sawmills was 60,779 MBF Scribner, with 20,926 MBF Scribner of timber processed, making utilization of timber-processing capacity among sawmills about 34 percent in 2002. Such low levels of capacity utilization often signal the closure of mills and this was no exception for Utah, which saw the closure and out-of-State relocation of its second largest sawmill during 2003. Across all industry sectors, total timber-processing capacity was 78,486 MBF Scribner. Accounting for changes in mills' log inventories, a total of 32,583 MBF Scribner was processed by Utah firms in 2002, making timber-processing capacity utilization about 42 percent across all sectors. The greater capacity utilization of all sectors compared to sawmills would indicate that processors other than sawmills were less likely to face a closure in the near future.

Mill Residue Volumes, Types, and Uses

Across all sectors, Utah timber processors produced 34,255 BDU (approximately 3,288 MCF) of mill residue, with 89 percent utilized (table U14). Total residue production declined from 7,721 MCF in 1992, while the proportion utilized increased from

83 percent (Keegan and others 1995). Utah's decreased residue production resulted from decreased timber volumes processed, while increased residue utilization was attributable to decreased residue production and the evolution of better uses for residue-related products, especially bark and coarse residues. Sawmills, the leading timber processors, were also the main residue producers in Utah, producing 0.98 BDU of residue per MBF of lumber in 2002 (table U15).

Coarse residue was the State's largest residue component at 56 percent (19,192 BDU) of all residues in 2002, with 86 percent utilized. In-State facilities used 13,419 BDU of the coarse material for unspecified uses, with the remaining utilized volume going to energy. Fine residues—sawdust and planer shavings—comprised the second largest component at 25 percent (8,430 BDU) of mill residues. More than 99 percent of fine residue was utilized in 2002, primarily as mulch or animal bedding, with about one-fourth of fine residues going to unspecified uses. Bark accounted for 19 percent of all residues and was largely used for mulch or unspecified uses, with 5,670 BDU (86 percent) utilized.

Primary Forest Products Markets and Sales

Sales from Utah's primary wood products industry during 2002 totaled nearly \$36.6 million, including finished products and mill residues (table U16). House logs and log homes accounted for 50 percent (more than \$18 million) of total sales; lumber, mine timbers, and other sawn products accounted for about 32 percent (almost \$12 million); while other products and mill residues accounted for 18 percent (nearly \$7 million). Utah was the leading market area for lumber, log homes, posts, poles, and log furniture, with in-State sales accounting for almost 46 percent of total sales. The other Four Corners States (Arizona, Colorado, and New Mexico) accounted for about 22 percent of total sales, with log homes accounting for 45 percent of sales in the region. The South accounted for over 14 percent of total sales, with log homes accounting for 84 percent of sales to the South. Following Utah, the Far West was a major market area for lumber and other sawn products.

Table U1—Utah nonreserved timberland by ownership class
(source: O'Brien 1999).

Ownership class	Thousand acres	Percentage of nonreserved timberland
National Forest	3,342	69
Private and tribal	961	20
Other public	565	12
Total	4,869	100

Table U2—Utah timber products harvested by ownership class, 2002.

Ownership class	Sawlogs	House logs	Other products ^a	All products
	----- Thousand board feet, Scribner -----			
Private and tribal timberland	11,816	1,976	2,490	16,282
National Forests	12,361	9,572	1,843	23,776
State lands	1,141	24	46	1,211
All owners	25,318	11,571	4,380	41,268
	--- Percentage of harvested product by ownership ---			
Private timberland	46.7	17.0	56.9	39.4
National Forests	48.8	82.7	42.1	57.6
State lands	4.5	0.2	1.1	2.9
All owners	61.3	28.0	10.6	100

^aOther products include industrial fuelwood, furniture logs, fiber logs, posts, and poles.

Table U3—Utah timber harvest by county, selected years (sources: Setzer and Throssell 1977b; Keegan and others 1995).

County	1974	1992	2002	1974	1992	2002
	----- MBF Scribner -----			-----Percentage of harvest-----		
Beaver	155	2,952	633	0.2	4.6	1.5
Cache	1,389	175	1,180	2.2	0.3	2.9
Carbon	260	100	1,670	0.4	0.2	4.0
Daggett	3,193	2,850	375	5.1	4.4	0.9
Davis	—	—	135	—	—	0.3
Duchesne	2,539	1,767	3,469	4.1	2.7	8.4
Emery	250	—	45	0.4	—	0.1
Garfield	8,502	7,047	3,446	13.6	10.9	8.4
Grand	5,000	—	20	8.0	—	<0.05
Iron	—	1,435	773	—	2.2	1.9
Juab	—	—	1	—	—	0.0
Kane	6,480	4,117	5,520	10.4	6.4	13.4
Millard	30	—	342	<0.05	—	0.8
Morgan	11	25	250	<0.05	<0.05	0.6
Piute	440	620	3,288	0.7	1.0	8.0
Rich	2,159	—	3,000	3.5	—	7.3
Salt Lake	—	—	65	—	—	0.2
San Juan	5,000	4,503	1,444	8.0	7.0	3.5
Sanpete	520	3,750	2,468	0.8	5.8	6.0
Sevier	715	3,663	1,703	1.1	5.7	4.1
Summit	5,589	10,000	4,107	8.9	15.5	10.0
Uintah	14,652	16,624	2,715	23.5	25.7	6.6
Utah	20	—	323	<0.05	—	0.8
Wasatch	1,606	2,908	3,750	2.6	4.5	9.1
Washington	—	—	375	—	—	0.9
Wayne	3,905	2,110	110	6.3	3.3	0.3
Weber	50	20	60	0.1	<0.05	0.1
Total	62,465	64,666	41,268	100	100	100

Table U4—Proportion of Utah timber harvest by species, selected years (sources: Setzer and Wilson 1970; Setzer 1971d; Setzer and Throssell 1977b; Keegan and others 1995).

Species	1966	1969	1974	1992	2002
	----- <i>Percentage of harvest</i> -----				
Spruce ^a	19	13	22	35	44
Lodgepole pine	18	18	27	46	23
Ponderosa pine	50	43	33	5	13
Aspen and cottonwood	d	d	4	5	10
Douglas-fir	3	11	8	4	8
True firs ^b	4	7	3	5	2
Other species ^c	6	8	3	<0.5	<0.5
All species	100	100	100	100	100

^aSpruce includes Engelmann and blue spruce.
^bTrue firs include white, subalpine, and corkbark fir.
^cOther species include juniper and hardwoods.
^dIncluded with other species.

Table U5—Utah timber harvest by species and product, 2002.

Species	Sawlogs	House logs	Other products ^a	All products
	----- <i>Thousand board feet, Scribner</i> -----			
Spruce ^b	11,464	6,170	466	18,100
Lodgepole pine	3,597	4,009	1,759	9,365
Ponderosa pine	4,309	937	13	5,259
Aspen and cottonwood	2,189	—	1,994	4,184
Douglas-fir	2,942	355	61	3,357
True firs ^c	684	100	21	805
Other species ^d	133	—	66	199
All species	25,318	11,571	4,380	41,268
	----- <i>Percentage of product by species</i> -----			
Spruce ^b	45.3	53.3	10.6	43.9
Lodgepole pine	14.2	34.6	40.2	22.7
Ponderosa pine	17.0	8.1	0.3	12.7
Aspen and cottonwood	8.6	—	45.5	10.1
Douglas-fir	11.6	3.1	1.4	8.1
True firs ^c	2.7	0.9	0.5	2.0
Other species ^d	0.5	—	1.5	0.5
All species	61.3	28.0	10.6	100

^aOther products include industrial fuelwood, furniture logs, fiber logs, posts, and poles.
^bSpruce includes Engelmann and blue spruce.
^cTrue firs include white, subalpine, and corkbark fir.
^dOther species include juniper and hardwoods.

Table U6—Utah timber products imports and exports, 2002.

Timber product	Imports	Exports	Net imports (Net exports)
<i>----- Thousand board feet, Scribner -----</i>			
Sawlogs	1,260	6,377	(5,117)
House logs	1,475	3,177	(1,702)
Other products ^a	95	2,026	(1,931)
All products	2,830	11,580	(8,751)

^aOther products include industrial fuelwood, furniture logs, fiber logs, posts, and poles.

Table U7—Ownership of timber products received by Utah mills, 1992 and 2002 (source: Keegan and others 1995).

Ownership class	1992		2002	
	MBF Scribner	Percentage of total	MBF Scribner	Percentage of total
Private and tribal timberland	11,341	19.3	9,241	28.4
Public timberland	46,927	79.9	23,245	71.5
National Forest	46,595	79.3	21,898	67.3
State lands	332	0.6	1,346	4.1
Other owners ^a	485	0.8	33	0.1
All owners	58,753	100	32,518	100

^aOther owners include the BLM, Canada, and (for 1992) unknown owners.

Table U8—Timber received by Utah forest products industry by ownership class and product, 2002.

Ownership class	Sawlogs	House logs	Other products ^a	All products
<i>----- Thousand board feet, Scribner -----</i>				
Private and tribal timberland	7,630	951	661	9,241
Public timberland	12,571	8,918	1,755	23,245
National Forest	11,571	8,618	1,709	21,898
State lands	1,000	300	46	1,346
Other owners ^b	—	—	33	33
All owners	20,201	9,869	2,448	32,518
<i>----- Percentage of product by owner -----</i>				
Private and tribal timberland	37.8	9.6	27.0	28.4
Public timberland	62.2	90.4	71.7	71.5
National Forest	57.3	87.3	69.8	67.3
State lands	5.0	3.0	1.9	4.1
Other owners ^b	—	—	1.3	0.1
All owners	62.1	30.3	7.5	100

^aOther products include furniture logs, fiber logs, posts, and poles.

^bOther owners include the BLM and Canada.

Table U9—Active Utah primary wood products facilities by county and product, 2002.

County	Lumber	Log homes and house logs	Log furniture and other products ^a	Total
Beaver	1		1	2
Cache	3		1	4
Davis	1			1
Duchesne	2	2		4
Emery	1			1
Garfield	1	1	1	3
Iron	1		1	2
Millard			1	1
Morgan	1			1
Piute			1	1
Salt Lake	1	1	2	4
San Juan	1			1
Sanpete		1	1	2
Sevier	1			1
Summit	3	1		4
Uintah	1	4	1	6
Utah			2	2
Wasatch	2	2		4
Wayne	2	1		3
Weber	1	1		2
2002 Total	23	14	12	49
1992 Total	34	13	4	51

^aOther products include posts, poles, and bark products.

Table U10—Finished product sales of Utah's primary wood products sectors, 1992 and 2002 (source: Keegan and others 1995).

Sector	1992	2002
	<i>Thousands of 2002 dollars</i>	
Sawmills	\$24,102	\$12,873
Log homes	8,103	18,486
Other sectors ^a	864	2,895
Total ^b	\$33,069	\$34,254

^aOther sectors include producers of posts, poles, and log furniture. Mill residues, firewood, mulch, and bark products not included for comparison to previous years.

^bAll sales are reported F.O.B. the manufacturer's plant.

Table U11—Utah sawmills by production size class, selected years (sources: Setzer and Wilson 1970; Keegan and others 1995).

Year	Under 1 MMBF ^a	Over 1 MMBF ^a	Total
<i>----- Number of Sawmills -----</i>			
2002	17	6	23
1992	25	9	34
1966	37	13	50
<i>Percentage of lumber output</i>			<i>Volume (MBF^b)</i>
2002	13	87	26,524
1992	13	87	63,637
1966	10	90	72,000

^aSize class is based on reported lumber production.

MMBF = million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table U12—Number of Utah sawmills and average lumber production, selected years (sources: Setzer and Wilson 1970; Keegan and others 1995).

Year	Number of sawmills	Average production per mill
<i>MMBF^a</i>		
2002	23	1.2
1992	34	1.9
1966	50	1.4

^aMMBF = million board feet lumber tally.

Table U13—Utah lumber production by mill size, 2002.

Size class ^a	Number of mills	Volume	Percentage of total	Average per mill
		<i>MBF^b</i>		
Over 1 MMBF	6	23,062	87	3,844
Under 1 MMBF	17	3,462	13	204
Total	23	26,524	100	1,153

^aSize class is based on reported lumber production. MMBF denotes million board feet lumber tally.

^bMBF = thousand board feet lumber tally.

Table U14—Production and disposition of Utah mill residues, 2002.

Residue type	Total utilized	Pulp and board	Energy	Mulch/ bedding	Unspecified use	Unused	Total produced
----- <i>Bone-dry units^a</i> -----							
Coarse	16,501	—	3,082	—	13,419	2,691	19,192
Fine	8,387	—	2	6,378	2,007	43	8,430
Sawdust	5,639	—	2	5,179	458	43	5,682
Planer shavings	2,748	—	—	1,199	1,549	—	2,748
Bark	5,670	300	1,281	953	3,136	963	6,633
Total	30,558	300	4,365	7,331	18,562	3,697	34,255
----- <i>Percentage of residue type</i> -----							
Coarse	86.0	—	16.1	—	69.9	14.0	56.0
Fine	99.5	—	0.0	75.7	23.8	0.5	24.6
Sawdust	99.2	—	0.0	91.1	8.1	0.8	16.6
Planer shavings	100.0	—	—	43.6	56.4	—	8.0
Bark	85.5	4.5	19.3	14.4	47.3	14.5	19.4
Total	89.2	0.9	12.7	21.4	54.2	10.8	100

^aBone-dry unit = 2,400 lb oven-dry wood.

Table U15—Utah sawmill residue factors, 1992 and 2002
(source: Keegan and others 1995).

Type of residue	1992	2002
<i>BDU/MBF lumber tally^a</i>		
Coarse	0.56	0.48
Sawdust	0.19	0.19
Planer shavings	0.06	0.10
Bark	0.28	0.21
Total	1.09	0.98

^aBone-dry unit (BDU = 2,400 lb oven-dry wood) of residue generated for every 1,000 board feet of lumber manufactured.

Table U16—Destination and sales value of Utah's primary wood products and mill residues, 2002.

Product	Utah	Other 4-Corner States	Other Rocky Mtn States	Far West ^a	Northeast ^b	South ^c	North Central ^d	Mexico, Canada, or other ^e	Total
-----Thousand 2002 dollars-----									
Lumber, mine timbers, and other sawn products	\$4,815	\$2,312	\$125	\$3,277	\$119	\$595	\$389	—	\$11,630
House logs and log homes	9,645	3,568	381	114	100	4,308	205	—	18,321
Other products ^f	2,245	1,989	273	793	350	243	739	—	6,632
Total	\$16,704	\$7,869	\$778	\$4,184	\$569	\$5,145	\$1,333	—	\$36,582
-----Percentage of regional sales by product-----									
Lumber, mine timbers, and other sawn products	28.8	29.4	16.0	78.3	20.9	11.6	29.2	—	31.8
House logs and log homes	57.7	45.3	48.9	2.7	17.6	83.7	15.4	—	50.1
Other products ^f	13.4	25.3	35.0	19.0	61.5	4.7	55.5	—	18.1
Total	45.7	21.5	2.1	11.4	1.6	14.1	3.6	—	100

^a Far West includes Alaska, California, Hawaii, and Washington.

^b Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

^c South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

^d North Central includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

^e Other includes European countries.

^f Other products include posts, poles, log furniture, mill residues, firewood, mulch, and bark products.

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