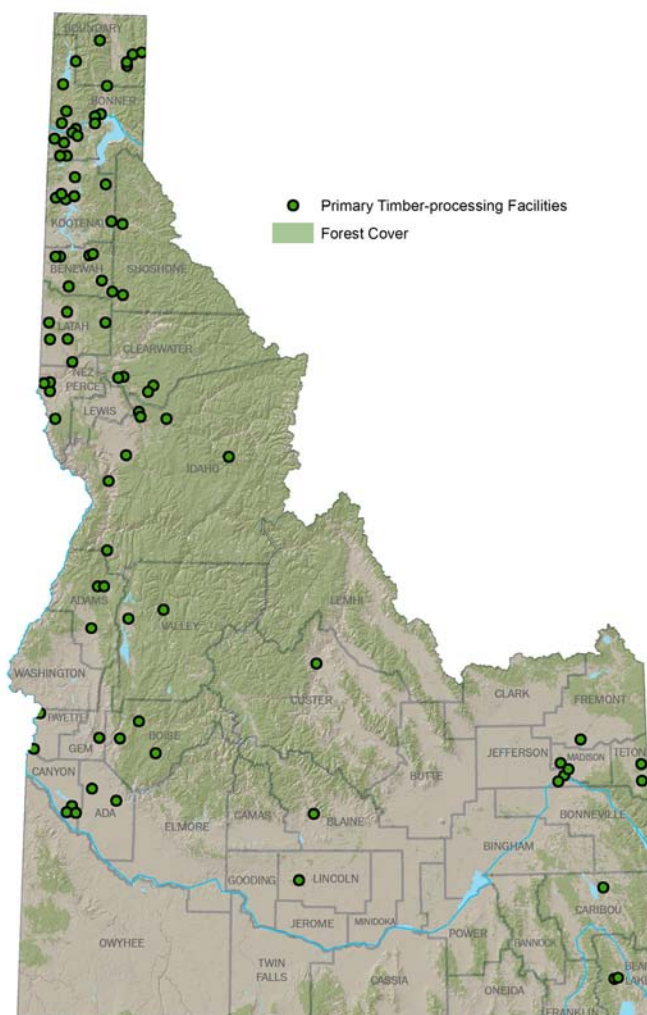




Idaho's Forest Products Industry and Timber Harvest 2011 with Trends Through 2013

**Eric A. Simmons, Steven W. Hayes, Todd A. Morgan,
Charles E. Keegan, III, and Chris Witt**



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Abstract

This report traces the flow of Idaho's 2011 timber harvest through the primary industries; provides a description of the structure, capacity, and condition of Idaho's industry; and quantifies volumes and uses of wood fiber. Historical wood products industry trends are discussed, as well as changes in harvest, production, employment, and sales.

Keywords: forest economics, mill residue, timber processors, wood utilization

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Highlights

- A total of 88 Primary wood facilities were identified as active in Idaho during 2011:
 - 27 Sawmills
 - 2 Plywood / veneer plants
 - 16 Log home facilities
 - 18 Residue related products facilities
 - 8 Cedar product manufacturers
 - 17 Post, pole, and log furniture producers
- Idaho's total timber harvest in 2011 was 1.07 billion board feet Scribner, more than 40 percent higher than the 2009 record low harvest, and approximately 5 percent lower than the pre-recession timber harvest volumes of 2006 and 2007.
- Timber harvest from non-industrial private timberlands fell from 31 percent of the total harvest in 2006 to just 12 percent in 2011. Public lands contributed 42 percent of the harvest in 2011 compared to 26 percent in 2006. State lands accounted for more than 30 percent of the 2011 harvest and National Forests accounted for almost 10 percent.
- Saw and veneer logs comprised over 88 percent of the total harvest. Clearwater, Benewah, Shoshone, and Latah counties were the largest contributors to the state's total harvest in 2011, accounting for 60 percent of total harvest volume.
- Idaho sawmills recovered an average of 1.67 board feet lumber tally per board foot Scribner of input, representing the first decline in sawmill overrun in 40 years. Idaho's 27 active sawmills produced 1.4 billion board feet of lumber during 2011.
- Idaho sawmills with a production capacity of over 50 Million Board Feet Lumber Tally (MMBF) annually accounted for 86 percent of Idaho's lumber production in 2011 compared to 94 percent in 2006 and just 39 percent in 1995.
- Idaho's primary forest products industry shipped products valued at \$1.4 billion (fob the producing mill) in 2011. Lumber and plywood/veneer contributed 36 percent of total sales while residue related products such as pulp and paper, particleboard, and other products represented 56 percent.
- Sawmills, along with plywood and veneer facilities, generated over 1.14 million bone-dry units (bdu) of wood residue during 2011 of which more than 99 percent was utilized.
- Idaho's log home industry was severely impacted by the Great Recession and U.S. housing bust of 2007-2009, and slow economic recovery since then. Log home sales during 2011 were down about 80 percent from 2006 levels, and timber use by Idaho's log home sector was down nearly 90 percent.

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Introduction

The purpose of this report is to describe the utilization of Idaho's 2011 timber harvest and the conditions, structure, and operations of the state's primary forest products industry. Primary forest products manufacturers are firms that process timber into manufactured products such as lumber, and facilities, such as pulp and paper mills and particleboard plants, that use the wood fiber residue directly from timber processors. This report also describes recent and historical trends in the state's timber use including raw material sources, inventory, growth, and harvest. Other areas covered in the report include the extent and efficiency of Idaho's processing infrastructure and the volume and value of finished products and residues.

Information in this report is primarily generated through a statewide periodic census of Idaho's manufacturers of primary forest products. The mill census also includes firms in adjacent states utilizing raw material from Idaho during the 2011 calendar year. Although great effort is made to collect data from every primary facility that operated during a census year, facilities may be added in subsequent surveys. Wherever appropriate, data from previous reports have been updated to make comparisons with new results.

This census is conducted in cooperation with 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.

The 2011 report focuses primarily on changes since the 2006 mill census with updated information through 2013 where available. Important relationships of current data to findings prior to 2006 have been noted. For a more detailed discussion of historic trends in timber harvesting and processing for Idaho see "Idaho's Forest Products Industry and Timber Harvest, 2006" (Brandt and others 2012).

Forest Industries Data Collection System

The Forest Industries Data Collection System (FIDACS) was developed by the BBER in cooperation with the FIA programs in the Rocky Mountain and Pacific Northwest research stations to collect, compile, and report data from primary forest products manufacturers.

Primary forest products firms were identified through the use of various phone directories, industry associations, internet searches, and through previous censuses. The written questionnaires were distributed by mail, fax, or email and were administered over the telephone when necessary. A single questionnaire was completed for each processing facility and includes the following information:

- Plant production, capacity, and employment
- Volume of raw material received by County, ownership, and product type
- Species mix and proportion of standing dead timber received
- Finished product volumes, types, sales value, and market locations
- Utilization and marketing of manufacturing residue

Similar forest products industry censuses have been conducted periodically in the Pacific Coast and Rocky Mountain States for over 30 years by the BBER and Forest Service research stations. Previous FIDACS censuses were completed for Idaho in 1979, 1980, 1985, 1990, 1995, 2001, and 2006 (Godfrey and others 1980; Keegan and others 1982, 1988, 1992, and 1997; Morgan and others 2004; Brandt and others 2012). Information collected through FIDACS is stored at the University of Montana's BBER. Additional information is available by request; however, individual firm-level data are confidential and will not be released.

The Operating Environment of Idaho's Forest Products Industry

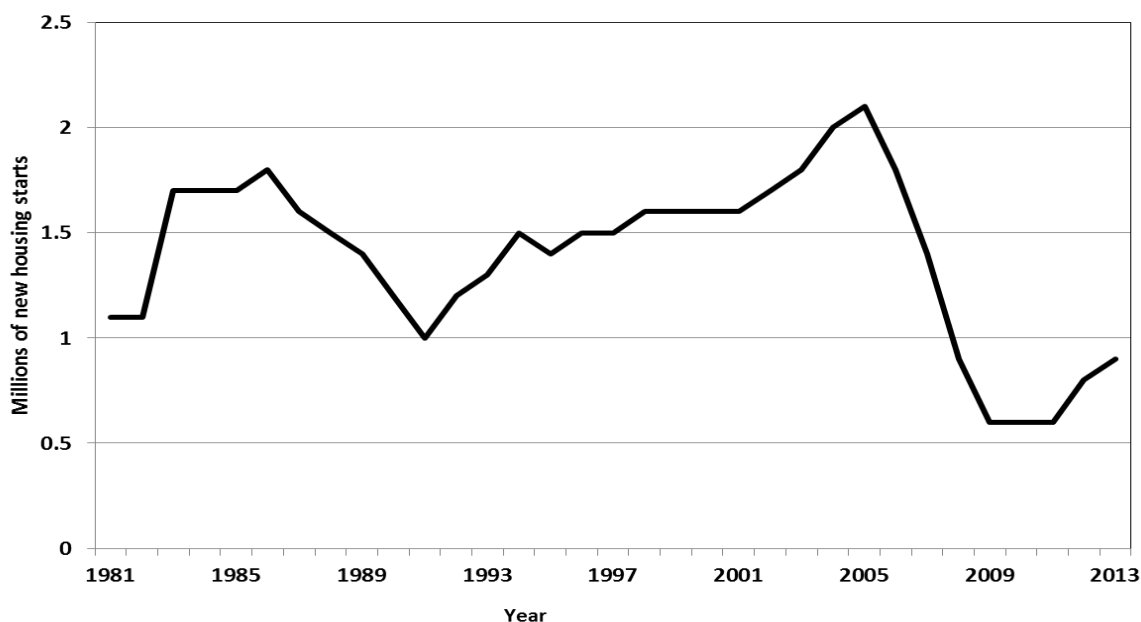
The last application of the FIDACS in Idaho detailed industry operations during 2006, which marked the end of several years of very high housing starts and record consumption of wood products in the United States (Woodall and others 2012). High housing and wood products demand were fueled not just by a strong economy, but by easy credit and rampant speculation in housing markets, which led to a frantic building pace in 2004 and 2005. With growing recognition of a housing bubble, housing markets began to decline, the inventory of unsold homes grew, new home construction slowed, and house prices began a downward spiral, ultimately resulting in the most difficult economic conditions since the Great Depression of the 1930s.

The collapse in home prices in the United States, and ultimately throughout the world, created a cataclysm in the subprime mortgage market and exposed the weakness of debt instruments backed by these mortgages. The loss in confidence in the debt instruments collateralized by mortgages bankrupted a number of major investment banks and was the catalyst for a global financial crisis in the last half of 2008. While a total breakdown of the global financial system was averted, the impacts on housing markets in the United States and many other countries were devastating.

Annual U.S. housing starts fell from almost 2.1 million units in 2005 to 554,000 units during 2009, their lowest level in more than six decades (fig. 1). Associated with the housing collapse was an official recession—often termed the “Great Recession”—that officially lasted from December of 2007 to June of 2009 (NBER 2010), but the impacts on home construction and demand for lumber and other wood products continued into 2010 and beyond. The challenging economic conditions experienced by the forest products industry in 2009 improved only slightly during 2010 and 2011. Housing starts in the United States grew by less than 6 percent during 2010 and 2011, and remained among the lowest levels since annual housing starts began being reported in the 1950s. Lumber consumption in the United States remained at historically low levels.

Through much of 2012, the economy grew slowly with lackluster recovery in housing and demand for wood products. Wood product markets in late 2012 and 2013 reflected the potential upside but also the uncertainty and volatility of recovering markets. As housing starts increased more than expected in the fourth quarter of 2012 and first quarter of 2013, lumber prices responded, reaching a high of over \$435 per MBF lumber tally in March and April 2013, the highest since 2006 and an increase of about \$100 per MBF from the second quarter 2012 (Random Lengths

Figure 1—United States housing starts 1980-2013 (source: U.S. Census Bureau 2013).



1976-2013). Mills throughout North America geared up and increased production by bringing recession-idled capacity back into operation. The additional supply of lumber and a mid-year cooling of the U.S. housing market drove lumber prices down, hitting a 2013 low of \$330 per MBF in June.

Lumber prices climbed steadily during late summer and fall 2013, approaching \$400 per MBF in the fourth quarter of 2013. Domestic demand for wood products through new construction, as well as repairs and remodeling continued upward and international markets were somewhat stronger than expected. Wood products markets in 2014 are expected to continue to improve, but with uncertainty in the domestic and international markets and considerable unutilized capacity to produce lumber in North America, wood products prices are expected to increase but remain volatile.

Idaho's 2011 Timber Harvest, Products, and Flow

Idaho Timberlands—About 40 percent of the total land area in Idaho is forestland. Just over 3 million acres of Idaho forestland are reserved through statute or administrative designation such as National Forest Wilderness areas and National Parks and Monuments, and not available for timber production. In 2011, Idaho had slightly less than 17 million acres of nonreserved timberlands available for timber production (USFS2011). The USDA Forest Service's National Forest System (NFS) is responsible for the administration of 72.8 percent of the state's timberlands (table 1). The remaining timberlands are divided among nonindustrial private owners, including tribal (9.0 percent), industrial private lands (7.7 percent), state endowment lands managed by the Idaho Department of Lands (IDL) (6.7 percent), Federal Bureau of Land Management (BLM) (3.7 percent), and other public ownership (0.2 percent).

Table 1--Idaho timberland by ownership class. (Source: FIA, FIDO online tool)

Ownership class	Acres	Percentage of Non-reserved timberland
National Forest	12,210,340	72.8
Undifferentiated private	2,796,786	16.7
State	1,116,072	6.7
Bureau of Land Management	616,546	3.7
Other public	31,915	0.2
All owners	16,771,659	100 ¹

¹ Total does not sum to 100 due to rounding

Ownership of industrial private timberlands in Idaho has undergone major changes in the last 10 years. Nationwide, many large forest products companies that once sought a high level of vertical integration to reduce operating costs have converted their corporate structures to real estate investment trusts (REITs) or sold their timberlands to timberland investment management organizations (TIMOs). One result is that the FIA program no longer uses the traditional industrial/non-industrial private ownership classifications, replacing them with corporate/non-corporate classifications. Together, REITs and TIMOs now control over 1 million acres of land in Idaho. In addition to managing forests for the sale of timber, REITs and TIMOs evaluate land parcels for their highest and best uses, including real estate potential on the open market. Some REITs and TIMOs generate revenue through the sale of conservation easements and recreation permits to allow access to timberlands.

Harvest Trends 1947 through 2013

The USDA Forest Service has kept comprehensive annual harvest data by ownership in Idaho since 1969. Other sources of information were used to develop harvest numbers for 1947 through 1969 (fig. 2). Idaho's timber harvest climbed after World War II, peaking in 1976 at 1.9 billion board feet. During the recession years of the early 1980s, harvest fell sharply, but rebounded in the last half of the 1980s to an average level of 1.6 billion board feet.

Throughout the 1990s and into the 2000s, Idaho's total timber harvest declined steadily because of a dramatic decline in harvest from National Forest lands. In 2001, the National Forest harvest for Idaho was the lowest to date since World War II and had declined by 629 MMBF (89 percent) from 1990. In 1998, the harvest volume from other public lands in Idaho surpassed the volume harvested from Idaho's National Forests for the first time on record. The volume of timber harvested from Idaho's private timberlands remained stable throughout the 1990s and into the new century; however, the proportion of the harvest coming from private lands increased steadily from 45 percent (732 MMBF) in 1990 to 72 percent (750 MMBF) in 2001 and 74 percent (834 MMBF) in 2006. Harvest from IDL and other public forest lands has followed a similar trend, with harvest volumes remaining fairly stable, but the proportion of the total harvest increasing from 14 percent (259 MMBF) in 1990 to nearly 20 percent (208 MMBF) by 2006.

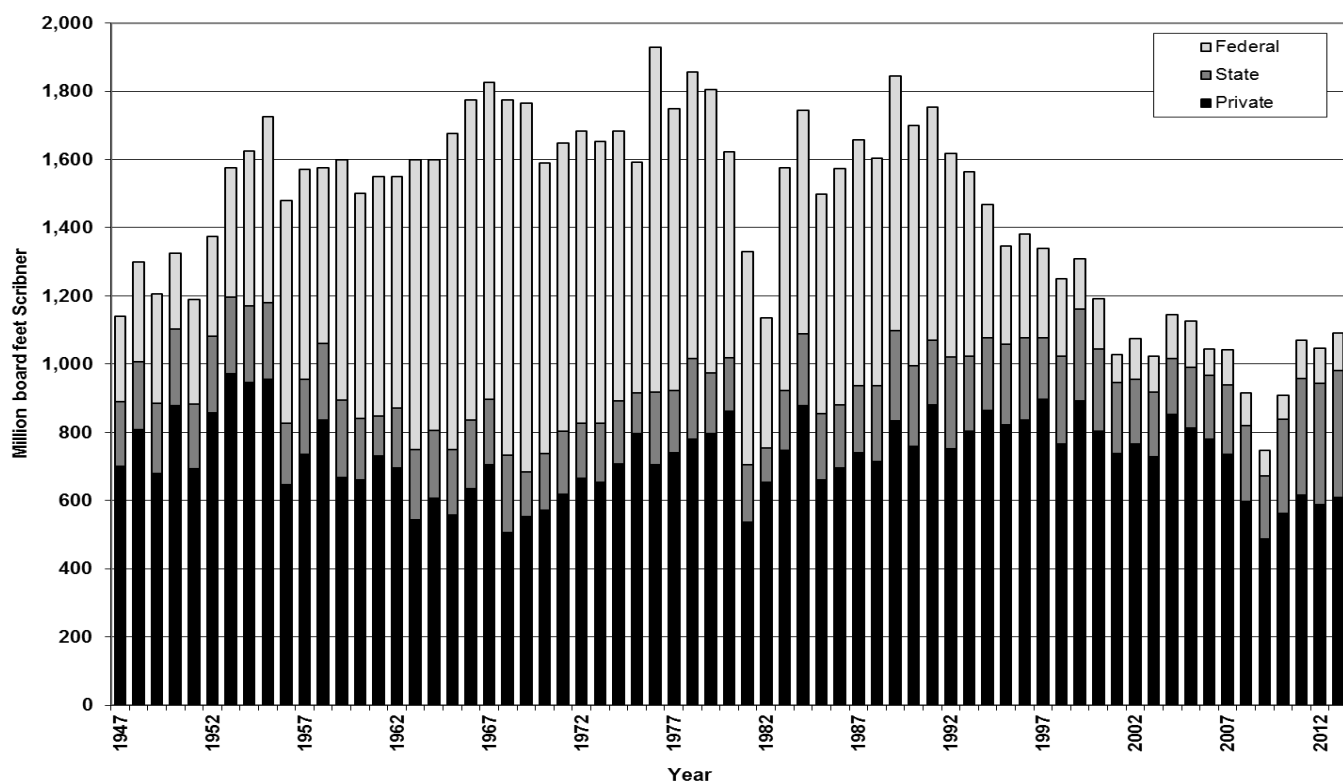


Figure 2—Idaho's timber harvest by ownership, 1947 through 2013 (sources: Bureau of Business and Economic Research, The University of Montana-Missoula; USDA Forest Service Region One, Missoula, Montana).

The Great Recession and dramatic declines in U.S. housing starts drove private lands timber harvest down steeply in 2008 and 2009. The 2009 total timber harvest in Idaho was less than 750 MMBF, the lowest since the end of World War II. By 2011, statewide timber harvest had recovered to the pre-recession level of just over 1 billion board feet, aided significantly by the increased sustained yield calculation and harvesting program on the State of Idaho's endowment timberlands. Idaho timber harvests for 2012 and 2013 were similar to the nearly 1.1 billion board feet harvested in 2011.

Harvest by Geographic Source

From 1979 to 1990, between 76 and 78 percent of Idaho's total timber harvest came from north of the Salmon River (table 2). Forests north of the Salmon River now provide nearly 90 percent of Idaho's timber harvest. Southern Idaho's harvest volumes have dropped dramatically from 440 MMBF in 1979 to 113 MMBF in 2011.

Clearwater County continued to lead the state in timber harvest with 222 MMBF in 2011—about 21 percent of Idaho's harvest. Other leading timber-producing counties were Benewah with 156 MMBF, Shoshone with 137 MMBF, Latah with 130 MMBF, Bonner with 98 MMBF, Idaho with 88 MMBF, and Kootenai with 70 MMBF. Together, these seven counties in northern Idaho supplied almost 85 percent of Idaho's 2011 timber harvest. Valley County had the largest harvest

in southern Idaho at 47 MMBF, which was 4.4 percent of the state's total harvest. Valley, Adams, and Boise counties contributed a combined 9.2 percent of the 2011 total state's harvest.

Harvest volumes in 2011 for both northern and southern Idaho were lower than 2006 but higher than in 2001. Since 1979, the harvest has declined by 456 MMBF (32 percent) in northern Idaho and 328 MMBF (75 percent) in southern Idaho. Compared to 2006, the 2011 harvest was down 2 percent (23 MMBF) in northern Idaho and 23 percent (32 MMBF) in southern Idaho.

Northern Idaho's most dramatic county-level changes from 1979 to 2011 occurred in Clearwater and Idaho counties where the combined harvest dropped by 495 MMBF (67 percent), 370 MMBF in Clearwater County and 125 MMBF in Idaho County. From 1979 to 1990, the harvest in Clearwater County fell by 182 MMBF (56 percent) from private lands and 89 MMBF (66 percent) drop in the National Forest harvest. Since 1990, Clearwater County's harvest has declined by 84 percent on National Forest lands, by 48 percent on state lands, and by 4 percent on industrial lands. In Idaho County, the harvest from National Forest lands fell 90 percent since 1990 and declined by 30 percent from other ownerships during that time.

Southern Idaho's most dramatic harvest decreases occurred in the southwestern counties of Adams, Boise, and Valley, where timber harvest has decreased by 146 MMBF (33 percent) since 1990 (table 2). Virtually all of the decrease can be attributed to sharply declining harvest levels from National Forest lands, which declined by approximately 87 percent since 1990. The harvest from other ownerships has remained essentially unchanged over the same period.

Table 2--Idaho timber harvest (MMBF, Scribner) by county, selected years (sources: Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

County	1979		1985		1990		1995		2001		2006		2011	
	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total	MMBF Scribner	Percent of Total
Northern Idaho														
Clearwater	544	29.4	335	21.0	267	15.8	234	17.1	182	18.1	174	15.6	221	20.7
Benewah	100	5.4	94	5.9	152	9.0	117	8.5	129	12.8	144	12.9	156	14.6
Shoshone	206	11.1	217	13.6	183	10.8	194	14.2	172	17.1	200	17.8	137	12.9
Latah	57	3.1	89	5.6	84	5.0	96	7.0	70	7.0	125	11.2	130	12.2
Bonner	142	7.7	175	11.0	197	11.6	139	10.1	124	12.3	93	8.3	98	9.2
Idaho	190	10.3	156	9.8	174	10.3	113	8.2	65	6.5	65	5.8	88	8.2
Kootenai	65	3.5	80	5.0	152	9.0	114	8.3	81	8.0	100	8.9	70	6.6
Boundary	94	5.1	80	5.0	86	5.1	69	5.0	57	5.7	53	4.8	39	3.6
Nez Perce	8	0.4	12	0.8	17	1.0	8	0.6	4	0.4	10	0.9	8	0.8
Lewis	4	0.2	13	0.8	20	1.2	17	1.2	14	1.4	12	1.1	6	0.6
Northern Idaho	1,410	76.2	1,254	78.7	1,332	78.7	1,100	80.3	899	89.3	976	87.1	953	89.4
Southern Idaho														
Valley	107	5.8	88	5.5	52	3.1	67	4.9	39	3.9	65	5.8	48	4.5
Boise	84	4.5	67	4.2	127	7.5	93	6.8	20	2.0	25	2.2	28	2.6
Adams	52	2.8	66	4.1	87	5.1	28	2.0	25	2.5	30	2.7	24	2.2
Washington	4	^b	9	0.6	4	^b	6	^b	-	^b	^c	^b	5	0.5
Elmore	25	1.4	14	0.9	5	^b	38	2.8	7	0.7	^c	^b	^c	^b
Other Counties	20	1.1	3	^b	6	^b	11	0.8	1	^b	6	0.5	^c	^b
Southwestern Idaho	292	15.8	247	15.5	281	16.6	242	17.7	91	9.0	126	11.3	104	9.8
Fremont	76	4.1	43	2.7	20	1.2	2	^b	3	^b	1	0.1	3	0.3
Lemhi	34	1.8	11	0.7	16	0.9	6	^b	1	^b	1	0.1	^c	^b
Clark	10	0.5	10	0.6	16	0.9	-	^b	1	^b	6	0.6	3	0.3
Caribou	4	^b	10	0.6	3	^b	5	^b	5	^b	4	0.3	^c	^b
Other Counties	24	1.3	19	1.2	24	1.4	15	1.1	7	0.7	7	0.6	3	0.3
Southeastern Idaho	148	8.0	93	5.8	79	4.7	27	2.0	17	1.7	19	1.7	9	0.8
Southern Idaho	440	23.8	340	21.3	360	21.3	269	19.7	108	10.7	145	12.9	113	10.6
Idaho Total	1,850	100.0	1,594	100.0	1,692	100.0	1,370	100.0	1,007	100.0	1,121	100.0	1,066	100.0

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

^bLess than 0.05 percent.

^cLess than 1 MMBF.

Harvest by Ownership and Product Type

Total harvest in Idaho in 2011 was 1,066 million board feet (MMBF) Scribner log scale, a decrease of approximately 5 percent (54 MMBF) from pre-recession 2006, and almost 43 percent higher than the 2009 low point (750 MMBF) during the Great Recession. Private industrial timberlands held stable around 46 percent (484 MMBF) of harvest. Timber harvested from non-industrial private forest (NIPF) lands fell from 31 percent of the total harvest in 2006 to just 12 percent for 2011 (from 348 MMBF to 130 MMBF). Public lands contributed 42 percent of the harvest in 2011 compared to 26 percent in 2006. Harvest from IDL lands increased from 18.6 percent to 32.6 of total harvest volume for 2011, 140 MMBF over 2006 (from 208 MMBF to 348 MMBF). National Forest harvest (103 MMBF) increased from 7 percent of total harvest in 2006 to 9.7 percent in 2011. The National Forest harvest in 2011 represented a 36 percent increase over 2006 (76 MMBF) and a 29 percent increase over 2001 (80 MMBF) (table 3).

Historically, the majority of Idaho's timber harvest has been processed into lumber and plywood, and in 2011, about 89 percent of Idaho's harvest was used to produce these products. Private lands continue to be the primary source of raw material for saw and veneer logs, providing 52 percent (549 MMBF) of the total supply in 2011 (table 4). Private lands accounted for about 76 percent of the saw and veneer logs in both 2006 and 2001. Prior to 1995, data showed private lands providing less than half of Idaho's saw and veneer log harvest (Keegan and others 1997; Morgan and others 2004).

Although substantial harvest declines from National Forests since the mid-1990s have contributed to the increase in the portion of harvest from private lands, 2011 saw a small reversal. In 2011, the National Forest provided 8.5 percent (90.5 MMBF) of Idaho's saw and veneer log harvest compared to just 6 percent (63 MMBF) and 7 percent (71 MMBF) in 2006 and 2001, respectively.

Idaho's pulpwood harvest in 2011 was 74 MMBF, an increase of 45 percent over 2006 (51 MMBF). Pulpwood represented 6.9 percent of the 2011 harvest compared to 4.5 percent in 2006. Strong pulpwood markets often occur when lumber production and prices are down. This is because sawmill residue supplies shrink and residue users, such as the pulp and paper industry, turn to chipped roundwood for their fiber needs. The pulp and paper sector typically relies on private lands for a large portion of their roundwood receipts. Private timberlands supplied 64 percent of the pulpwood volume in 2011 versus 77 percent in 2006, and 80 percent in 2001. The difference in the private harvest of pulpwood among study years indicates the strength of the pulp market during those years. National forests provided 10 percent of the 2011 pulpwood harvest and state lands provided 23 percent.

In 2011, the combined harvest for cedar products, house logs, posts, poles, rails, utility poles, and other products totaled 47.5 MMBF. Previous mill censuses indicated that the harvest for these products was 46 MMBF in 2006 and 43 MMBF in 2001. Public timberlands provided 63.8 percent of the harvest for this group of products in 2011. This is about the same as 2006 (63 percent) and higher than 2001 (52 percent). The total harvest of cedar products in 2011 (30.5 MMBF) increased 35 percent from 2006 (22.6 MMBF) and was 3 percent higher than the 2001 harvest (29.5 MMBF). The total harvest for post, poles, utility poles, and

Table 3-- Idaho timber harvest (MBF, Scribner) by ownership class, selected years (sources: Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Ownership class	1979	1985	1990	1995	2001	2006	2011
----- Thousand board feet, Scribner -----							
Private	808,749	779,109	754,978	829,417	750,590	833,797	615,012
Industrial	455,721	467,474	364,178	467,518	443,029	485,590	484,176
Non-industrial private ^a	353,028	311,635	390,800	361,899	307,561	348,207	130,836
Public	1,041,719	814,787	937,560	540,296	256,704	286,813	450,893
National Forest	866,455	631,003	700,715	301,277	77,863	78,613	102,937
Other public ^b	175,264	183,784	236,845	239,019	178,841	208,200	347,956
All owners^b	1,850,468	1,593,896	1,692,538	1,369,713	1,007,294	1,120,610	1,065,905
----- Percent -----							
Private	43.7	48.9	44.6	60.6	74.5	74.4	57.7
Industrial	24.6	29.3	21.5	34.1	44.0	43.3	45.4
Non-industrial private ^a	19.1	19.6	23.1	26.4	30.5	31.1	12.3
Public	56.3	51.1	55.4	39.4	25.5	25.6	42.3
National Forest	46.8	39.6	41.4	22.0	7.7	7.0	9.7
Other public ^b	9.5	11.5	14.0	17.5	17.8	18.6	32.6
All owners^b	100	100	100	100	100	100	100

^a Non-industrial private includes Tribal harvest.

^b Other public refers to state owned timberlands and Bureau of Land Management timberlands.

Table 4--Idaho timber harvest by ownership class and timber product 2011.

Ownership class	Saw and veneer logs ^a	House logs	Cedar products	Other timber products ^b	All products
----- Thousand board feet, Scribner -----					
Private timberlands	549,247	127	11,039	54,599	615,012
Industrial	441,205	57	1,476	41,438	484,176
Non-industrial private ^c	108,042	70	9,563	13,161	130,836
Public timberlands	394,989	283	19,461	36,161	450,893
National Forest	90,501	178	2,300	9,958	102,937
State	300,631	105	15,028	25,703	341,467
BLM	3,857	-	2,133	500	6,490
All owners	944,236	410	30,500	90,760	1,065,905
----- Percent of harvest -----					
Private timberlands	51.5	0.01	1.0	5.1	57.7
Industrial	41.4	0.01	0.1	3.9	45.4
Non-industrial private ^c	10.1	0.01	0.9	1.2	12.3
Public timberlands	37.1	0.03	1.8	3.4	42.3
National Forest	8.5	0.02	0.2	0.9	9.7
State	28.2	0.01	1.4	2.4	32.0
BLM	0.4	-	0.2	0.05	0.6
All owners	88.6	0.04	2.9	8.5	100

^a Saw and veneer logs combined to prevent disclosure of firm level data.

^b Other timber products include logs used for pulpwood, posts and poles, utility poles, furniture logs, and energywood logs.

^c Non-industrial private includes Tribal harvest.

rails decreased 8.6 percent from 19.4 MMBF in 2006 (adjusted to reflect additional facilities) to 16.7 MMBF in 2011. Public land provided 63.8 percent of the harvest for cedar products and 63.7 percent of the harvest for posts, poles, utility poles, and rails. As a product of the Great Recession and the collapse of the construction boom, harvesting for house logs plummeted from 14 MMBF in 2006 to just 410 MBF. In 2006, 88 percent of the houselog harvest came from National Forests. In 2011, 43 percent came from National Forests, 31 percent from private lands, and 26 percent from IDL.

Harvest by Species

True firs (*Abies* spp.)—grand fir (*Abies grandis*) and subalpine fir (*Abies lasiocarpa* (Hook.) Nutt.)—were the largest component (35 percent) of Idaho’s 2011 timber harvest, which was similar to 2006 (table 5). Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) at 24 percent was the second largest component of the 2011 harvest. As in 2006, western redcedar (*Thuja plicata* Donn ex D. Donn) and ponderosa pine (*Pinus ponderosa* Dougl. ex Laws.) rounded out the top four most harvested species. These four species comprised 82 and 81 percent of the total harvest in 2006 and 2011 respectively. The decline in the harvest of western white pine (*Pinus monticola* Dougl. ex D. Don) has been the greatest change to occur in the species composition of the timber harvest in Idaho during the last 30 years. In 1969, the white pine harvest was about 343 MMBF and accounted for 19 percent of Idaho’s timber harvest; by 2001 the white pine timber harvest had dropped to 39 MMBF or 4 percent of the total harvest. In 2006 and again in 2011, the western white pine harvest in Idaho had declined further, making up just 1 percent of Idaho’s timber harvest. This change is the result of several interacting factors but by far the biggest blow to white pine was dealt by white pine blister rust, an exotic disease introduced to the United States from Europe in the early 1900s. By the 1940s, blister rust had reached epidemic levels and caused great damage to the white pine resource throughout the Inland Northwest (Fins and others 2001).

Table 5--Proportion of Idaho timber harvest by species, selected years (sources: Setzer 1970; Morgan and others 2004; Brandt and others 2012).

Species	1969	1979	1985	1990	1995	2001	2006	2011
----- Percentage of harvest (MBF, Scribner) -----								
True firs	24	22	27	23	25	24	34	35
Douglas-fir	18	20	21	22	27	26	28	24
Western redcedar	7	11	10	11	9	10	13	12
Ponderosa pine	14	13	12	18	17	7	7	10
Western hemlock	^a	1	3	3	4	12	4	7
Western larch	6	6	6	6	6	10	5	6
Lodgepole pine	4	8	10	10	6	5	5	3
Spruces	^a	3	5	3	2	2	2	2
Western white pine	19	8	6	5	3	4	1	1
Other species ^a	8	9	1	N/A	2	N/A	1	N/A
All species ^b	100	100	100	100	100	100	100	100

^aWestern hemlock and Englemann spruce were included in the other species group in 1969.

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

Species Composition of Product Types

In 2011, all of Idaho's species groups were used to produce lumber. Overall harvest by species for 2011 closely matched what was found in 2006. As in 2006, true firs were the species most harvested for saw and veneer logs, comprising 36 percent of the saw and veneer log harvest, while Douglas-fir accounted for 26 percent (table 6). Western redcedar and ponderosa pine represented 10 percent and 11 percent of the saw and veneer log harvest in Idaho respectively.

Changes in the harvest for products other than saw and veneer logs can be attributed to the influence of reduced demand for saw/veneer logs, house logs, and strong pulpwood markets. The 2011 harvest for other timber products (90 MMBF) including pulpwood, posts and poles, furniture log, and energy wood, was primarily made up of true firs (44 percent), western hemlock (26 percent), western redcedar (15 percent), and Douglas-fir (8 percent). Posts and small poles accounted for 3.6 percent (3.3 MMBF) for other products. The primary species harvested for posts and small non-utility pole products were lodgepole pine (*Pinus contorta* Dougl. Ex Loud.) (79 percent) and ponderosa pine (14 percent). The western redcedar harvested for other timber products was used entirely to make utility poles. Harvest for cedar products was 30 MMBF in 2011, 30 percent higher than in 2006 (23 MMBF). In 2006, Engelmann spruce (*Picea engelmannii* Parry ex Engelm.), and Douglas-fir accounted for 60 percent of the house log harvest, in 2011 they were only 25 percent. Lodgepole pine and ponderosa pine comprised 59 percent of the timber used for house logs during 2011.

Table 6--Idaho timber harvest by species and timber product, 2011.

Species	Saw and veneer logs ^a	House logs	Cedar products ^b	Other timber products ^c	All products
----- Thousand board feet, Scribner -----					
True firs	338,437	35	-	39,869	378,341
Douglas-fir	244,200	37	-	7,711	251,947
Western redcedar	91,191	11	30,500	13,876	135,579
Ponderosa pine	105,775	54	-	1,026	106,854
Western hemlock	51,057	-	-	23,562	74,619
Western larch	61,021	12	-	549	61,581
Lodgepole pine	28,587	188	-	3,390	32,164
Spruce	16,620	68	-	426	17,113
Western white pine	7,349	6	-	352	7,707
All species	944,236	410	30,500	90,760	1,065,905
----- Percent of harvest by product -----					
True firs	36	8	-	44	35
Douglas-fir	26	9	-	8	24
Western redcedar	10	3	100	15	13
Ponderosa pine	11	13	-	1	10
Western hemlock	5	-	-	26	7
Western larch	6	3	-	1	6
Lodgepole pine	3	46	-	4	3
Spruce	2	16	-	-	2
Western white pine	1	1	-	-	1
All species^d	100	100	100	100	100

^a Saw and veneer logs combined to prevent disclosure of firm level data.

^b Cedar products include logs used for cedar shakes, shingles and split rail fencing.

^c Other timber products include logs used for pulpwood, posts and poles, utility poles firewood, furniture log, and energy wood.

^d Percentage detail may not sum to 100% due to rounding.

Movement of Timber Products

The concentration of production at fewer and larger wood products facilities and shifting patterns of harvest have created manufacturing centers that draw timber from large geographic areas. Thus, large volumes of timber move across county and state boundary lines, because most Idaho counties with mills, especially in southern Idaho, now have only one or two timber processing facilities. To avoid disclosure of firm-level timber receipt information, timber movement is described by three broad geographic regions: northern Idaho, southwestern Idaho, and southeastern Idaho.

Movement across state lines—In 2011, 9 percent (95 MMBF) of Idaho's harvest was shipped for processing outside of the state (table 7). Idaho's primary wood products manufacturers received 102 MMBF of timber that was harvested outside of Idaho, making the state a net importer of nearly 7 MMBF of timber in 2011. Previous reports indicated that Idaho had net log flow out of Idaho ranging from 7 to 39 MMBF (Brandt and others 2012). Idaho mills received over 16 MMBF of timber from Canada in 2011, compared to 9 MMBF in 2006 and 28 MMBF in 2001. In 2011, 59 percent (51 MMBF) of Idaho's timber imports came from Washington, 37 percent (32 MMBF) from Montana, and the balance came from Wyoming, Utah, Oregon, and Canada.

Southern Idaho counties supplied 55 percent (52 MMBF) of Idaho's log flow to other states in 2011, with southwestern Idaho counties accounting for the majority (44 MMBF) of that volume, and northern Idaho counties were the source of the remaining 45 percent (43 MMBF) of log flow to other states.

Saw and veneer logs were the major component of timber harvest flowing into and out of Idaho. In 2011, Idaho sawmills and plywood/veneer mills imported 92 MMBF of saw and veneer logs, while 82 MMBF of saw and veneer logs went out of state. About 4 MMBF were imported for cedar products and 5 MMBF for other products. Most of the volume for other products that went out of Idaho went for pulp and paper products.

Movement within Idaho—More than 90 percent (970 MMBF) of Idaho's 2011 timber harvest was processed within the state (table 8). Timber movement among Idaho's three regions is somewhat varied. In northern Idaho, 95 percent of timber harvested was processed within the region of harvest, essentially the same as in 2006. However, in southeastern Idaho, only 16 percent was processed in the region

Table 7--Log flow into and out of Idaho, 2011.

Timber products	Log flow into Idaho	Log flow out of Idaho	Net imports (net exports)
----- Thousand board feet, Scribner -----			
Saw and veneer logs	92,432	81,591	10,841
House logs	1,459	8	1,451
Cedar products	3,700	1,045	2,655
Other products ^a	4,843	12,807	(7,964)
All products	102,433	95,451	6,982

^aOther products include logs for pulpwood, posts and poles, log furniture, and industrial fuelwood.

Table 8--Intra-state and inter-state timber flow of 2011 Idaho timber harvest.

Region of harvest	Intra-state timber flow					Inter-state timber flow		
	Delivered to county of harvest	Delivered to adjacent ID county	Delivered to non-adjacent ID county	Total delivered to northern Idaho	Total delivered to southwestern Idaho	Total delivered to southeastern Idaho	Total delivered to Idaho	Total delivered out-of-State
----- Thousand board feet, Scribner -----								
Northern Idaho	305,382	460,533	143,756	906,894	2,759	18	909,671	43,639
Southwestern Idaho	13,144	31,754	14,373	35,095	24,163	13	59,270	44,329
Southeastern Idaho	987	356	170	37	-	1,476	1,513	7,483
Idaho total	319,512	492,642	158,299	942,026	26,922	1,506	970,454	95,451
----- Percentage of total harvest by region -----								
Northern Idaho	32	48	15	95	0	-	95	5
Southwestern Idaho	13	31	14	34	23	0	57	43
Southeastern Idaho	11	4	2	0	-	16	17	83
Idaho Total	30	46	15	88	3	0	91	9
								100

where it was harvested, a sharp decline from the 46 percent that remained in the region during 2006. In southwestern Idaho, the trend was the opposite, with 23 percent of the 2011 harvest processed in the region compared to 20 percent in 2006. Seventy percent of the timber harvested in 2011 was processed in a county other than the county of harvest, quite similar to 73 percent in 2006 and 68 percent in 2001. These data suggest timber is traveling a greater distance to be processed than historically, and reflect the loss of milling infrastructure in southern Idaho (fig. 3).

Northern Idaho: The 10 counties north of the Salmon River are the center of Idaho's timber harvesting and processing activities. The 2011 total harvest in these counties was about 953 MMBF, or 89 percent of the state's harvest. Ninety-five percent (906 MMBF) of the timber harvested in northern Idaho was processed in northern Idaho, while the remaining 5 percent (50 MMBF) was processed in another region or state. Only 3 MMBF of timber harvest in northern Idaho was processed south of the Salmon River. Thirty-two percent of timber harvested in northern Idaho was processed in the county of harvest. Forty-eight percent was processed in counties adjacent to (sharing a county line with) the county of harvest, and 15 percent was processed in counties not adjacent to the county of harvest.

Southwestern Idaho: Just over 103 MMBF of timber, 10 percent of the state's total harvest was harvested in the 10 southwestern counties in 2011. Approximately 43 percent (44 MMBF) was processed outside the state. Of the 57 percent (59 MMBF) that was processed in Idaho, 24 MMBF were processed in southwestern Idaho, and 35 MMBF of this harvest was processed in northern Idaho, with virtually none of the harvest being processed in southeastern Idaho. Within southwestern Idaho, 13 percent (13 MMBF) of the timber was processed in the county of harvest, while 87 percent (90 MMBF) was processed in other counties. About

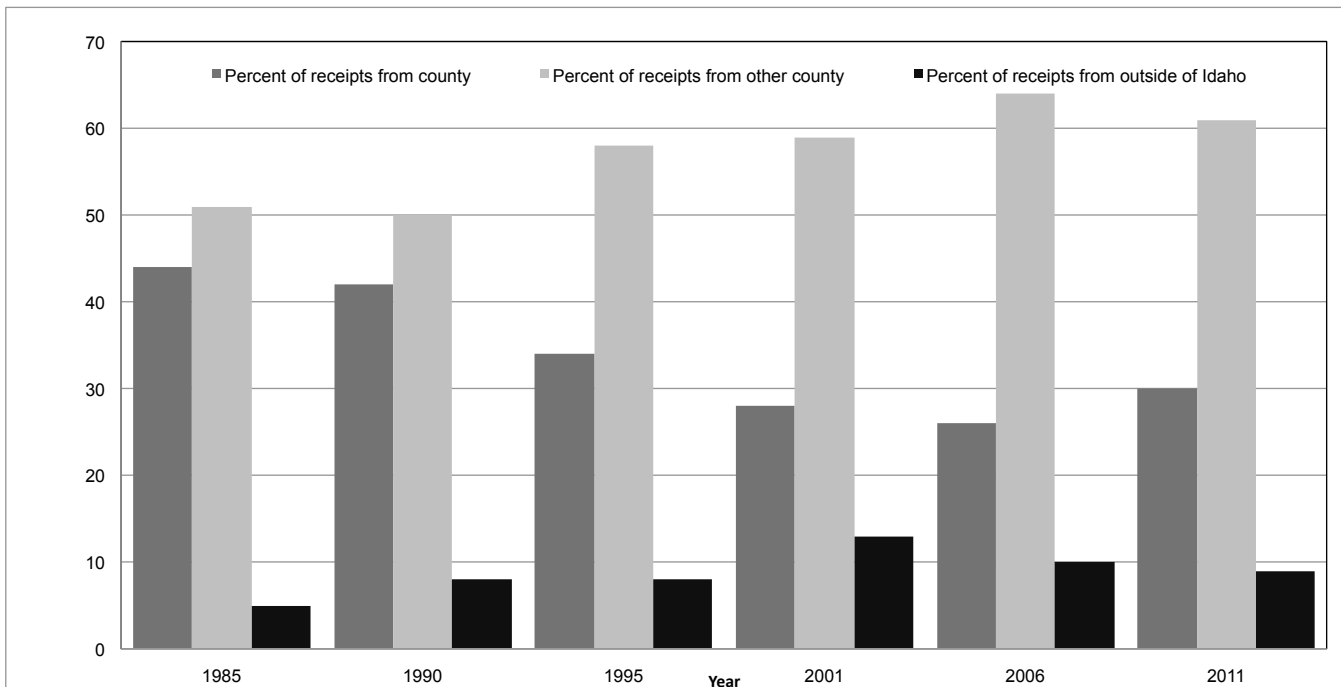


Figure 3—Movement of timber in Idaho select years.

32 MMBF was processed in counties adjacent to the county of harvest, and 14 MMBF were processed in counties not adjacent to the county of harvest.

Southeastern Idaho: Southeastern Idaho accounted for the smallest percentage of volume harvested in Idaho in 2011, with only 9 MMBF (1 percent). Less than a quarter of this volume (1.5 MMBF) was processed in Idaho; 7.5 MMBF were processed outside the state. Of the 1.5 MMBF processed in Idaho, 97.5 percent stayed in southeastern Idaho with the remaining 2.5 percent processed in northern Idaho. Of the timber harvested in southeastern Idaho that remained in the state for processing, 65 percent was processed in the county of harvest and 24 percent was processed in counties adjacent to the county of harvest. The remaining 11 percent was processed in counties not adjacent to the county of harvest.

End Uses of Idaho's Timber

In this section, we trace the flow of Idaho's timber harvest through the state's primary manufacturing sectors. Because timber, wood products, and mill residue are displayed, volumes are presented in cubic feet rather than board feet Scribner. These figures refer to Idaho's timber harvest and include timber products shipped to out-of-state mills; they do not include timber harvested in other states and processed in Idaho. The following conversion factors were used to convert board foot Scribner volume to cubic foot volume:

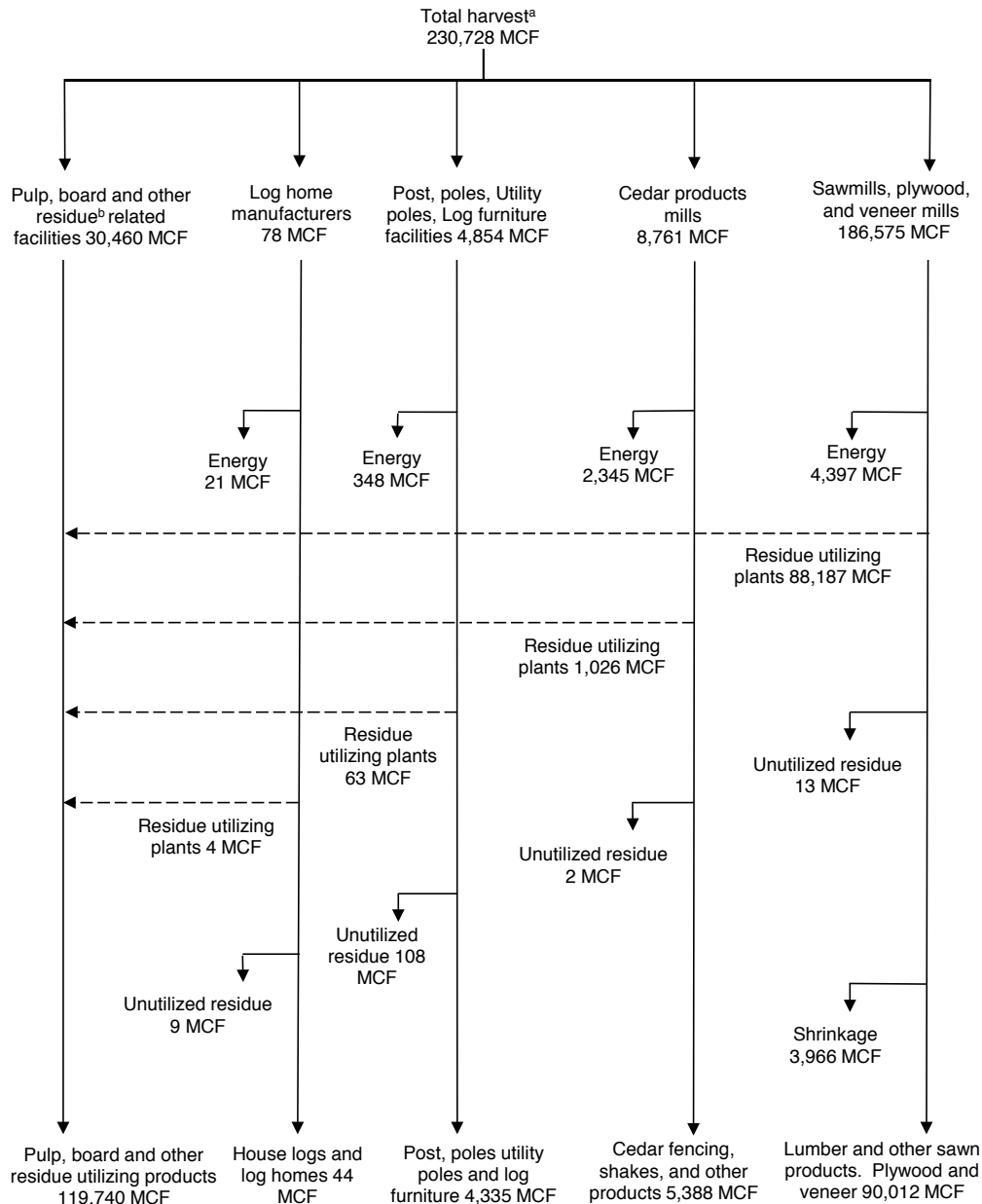
- 5.07 board feet Scribner per cubic foot for saw and veneer logs
- 5.23 board feet per cubic foot for house logs
- 3.58 board feet per cubic foot for cedar logs
- 1.56 board feet per cubic foot for post and poles
- 4.87 board feet per cubic foot for utility poles
- 1.99 board feet per cubic foot for log furniture
- 2.43 board feet per cubic foot for pulpwood and all other timber products

During 2011, Idaho's timber harvest was approximately 230,728 thousand cubic feet (MCF), exclusive of bark (fig. 4). Of this volume, 186,575 MCF went to sawmills and plywood plants, 30,460 MCF to pulp, 8,761 MCF to cedar mills, 4,854 MCF to posts, poles, utility poles, and log furniture manufacturers, and 78 MCF to log home manufacturers.

Of the 186,575 MCF received by sawmills and plywood plants, 90,012 MCF (48 percent) became finished lumber, other sawn products, or plywood and veneer products, and 3,966 MCF were lost to shrinkage. The remaining 92,597 MCF of wood fiber became mill residue. About 88,187 MCF of sawmill residues were used as raw material by pulp mills and board plants; 4,397 MCF were sold or used internally as hog fuel to generate energy. Only 13 MCF of sawmill and plywood plant residues went unused in 2011.

Pulp and paper mills and other residue-using plants, both in Idaho and in other states, received approximately 30,460 MCF of wood fiber from Idaho timberlands. Saw and veneer mills supplied 88,187 MCF of mill residue to pulp and board manufacturers, and other sectors supplied 1,093 MCF.

Cedar mills received 8,761 MCF of timber, of which 5,388 MCF became cedar products and 2,345 MCF were sold or used for energy/hog fuel. Post, pole, utility pole, and log furniture manufacturers received 4,854 MCF and produced 4,335 MCF in products. Log home manufacturers received 78 MCF, of which 44 MCF became house logs. Mills in this and the post/pole/furniture sector seldom supplied residue for use in other sectors. Most of the residue from these facilities was used as firewood, livestock bedding, and landscape/mulch products.



^a Harvest volume does not include bark.

^b Other residue related facilities include energy plants, energy products, roundwood chipping, mulch, and animal bedding operations.

Figure 4—Idaho's timber harvest and flow, 2011.

Structure of Idaho's Forest Products Industry

Structure and Location

In 2011, timber-processing facilities operated in 27 of Idaho's 44 counties, while timber was harvested in 29 counties. Idaho's 10 northern counties contain the greatest concentration of the primary forest products industry (fig. 5), which includes plants that manufacture:

- Lumber and other sawn products
- Veneer/plywood
- Posts, utility poles, small poles, stakes, and roundwood furniture
- House logs and log homes
- Cedar products—shakes, shingles and split rail fencing
- Other products including pulp and paper, particleboard, chips, decorative bark, wood fuel pellets, and energy from biomass

The 2011 FIDACs mill census identified 88 active primary forest products plants (table 9), 26 fewer than in 2006. Every sector experienced temporary or permanent closures during the poor market conditions from 2007 to 2011. The log home sector was the hardest hit in the years between 2006 and 2011. Because there are only two plywood/veneer facilities remaining in Idaho, mill level data for this sector have been combined with the sawmill analysis to prevent disclosure. Several large facilities have closed since the last study; these closures are addressed in more detail in the individual sector discussions.

Idaho Primary Wood Processing Facilities, 2011

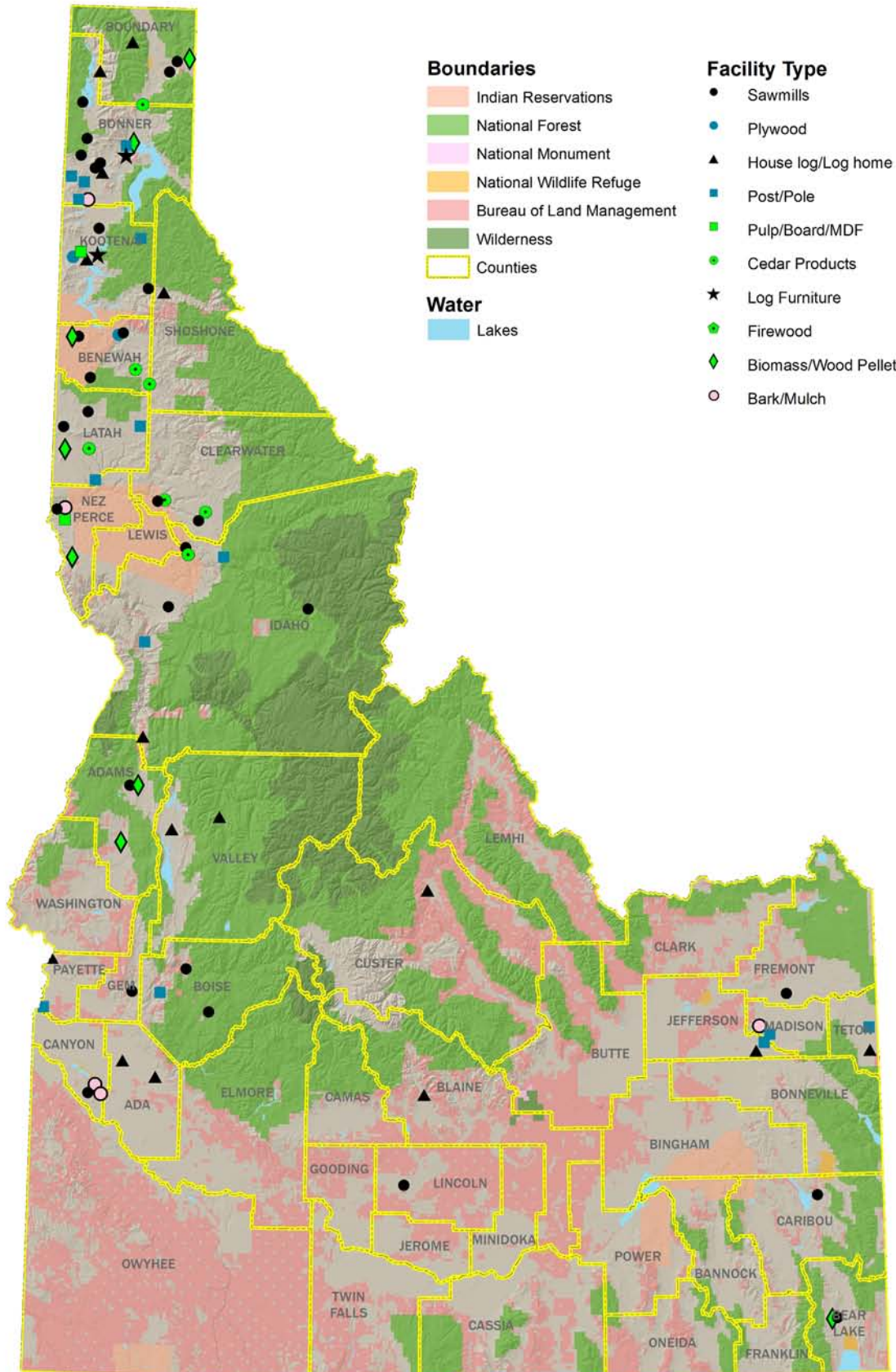


Figure 5—Location of Idaho's active primary forest products manufacturers, 2011.

Table 9--Active Idaho primary wood products facilities by county and product during 2011 and other years (sources: Keegan and others 1997; Morgan and others 2004; Brandt and others 2012).

County	Lumber	Veneer/plywood	Post, poles, and log furniture	Log homes	Cedar products	Residue-related products ^a	All products
Ada	1			2		1	4
Adams	1					2	3
Bear Lake	1			1		1	3
Benewah	3	1			2	1	7
Blaine				1			1
Boise	2		1				3
Bonner	3		6	2	1	1	13
Boundary	2			2	1	2	7
Canyon			1			1	2
Caribou	1						1
Clearwater	2				2		4
Custer				1			1
Fremont	1						1
Gem	1						1
Idaho	3		2	2			7
Jefferson			1	1			2
Kootenai	2	1	2	1		2	8
Latah	2		2		1	1	6
Lewis					1		1
Lincoln	1						1
Madison			1			1	2
Nez Perce	1					3	4
Payette				1			1
Shoshone				1		1	2
Teton			1				
Twin Falls				1			1
Valley				1			1
2011 Total	27	2	17	16	8	18	88
2006 Total ^b	38	3	21	26	8	18	114
2001 Total	35	4	22	21	10	17	109
1995 Total	62	6	32	32	15	15	162
1990 Total	80	6	27	22	26	11	172
1985 Total	90	7	26	20	25	6	174
1979 Total	133	8	35	15	44	7	242

^aResidue-related products include particleboard, chips, pulp and paper products, bioenergy products, and decorative bark.

^b2006 numbers have been adjusted to reflect facilities active but not previously reported.

Sales Value of Primary Wood Products

The periodic wood products industry censuses for Idaho have been produced since 1979 and provide the most complete estimates of sales values for Idaho's primary forest products industry. Various other sources were used to estimate sales values for the non-census years between 1977 and 2013 (Random Lengths 1976-2013; WWPA 1964-2013). All sales are reported free on board (f.o.b.) the producing mill. Sales by Idaho's primary forest products industry totaled \$1.4 billion in 2011, an inflation-adjusted decrease of nearly \$430 million (23 percent) from 2006 (table 10). Updated estimates indicate sales have increased since 2011 by \$300 million (20 percent) in 2011 dollars (Morgan and others 2014).

About 93 percent of primary wood products sales are concentrated in three sectors of the industry: sawmills, structural panels (plywood and veneer), and residue-related products. Residue-related products include particleboard, chips, pulp and paper products, bioenergy products, decorative bark, and mill residues. Sales values for residue-related products also include mill residues sold to users within Idaho as well as outside the state.

Sales values for lumber from Idaho sawmills peaked in 1978 at nearly \$1.5 billion (in 2011 dollars) (fig. 6) and sales of all primary products totaled \$2.4 billion in 1978. Since 1999 sales have declined steadily, primarily due to lower per-unit prices as well as curtailments and closures. The lumber sales value of nearly \$855 million in 2001 was the lowest since 1985 (\$806 million). To prevent disclosure of firm level information, sales data for lumber and other sawn products were combined with plywood and veneer sales in 2006. For 2006, sales of these products totaled almost \$865 million dollars. Since 2006 the Great Recession has reduced the sales value of lumber and plywood/veneer by 41 percent from \$865 to under \$513 million in 2011.

Total sales of all primary processors have been buoyed and stabilized to a degree by the expansion of the residue-utilizing sector. This sector has shown substantial increases in sales over the past 25 years and has become an increasingly important part of Idaho's forest products industry. Inflation-adjusted sales were about \$692 million in 1979, versus nearly \$790 million in 2011. Sales by residue utilizing manufacturers accounted for about 56 percent of Idaho's primary forest

Table 10--Sales value of Idaho's primary wood products, selected years (sources:Keegan and others 1982, 1988, 1992, 1997, Morgan and others 2004, Brandt and others 2012).

Product	1979	1985	1990	1995	2001	2006	2011
			----- Million 2011 dollars -----				
Lumber, timbers, other sawn products	1,434.3	805.6	874.4	994.4	854.7	864.8 ^b	512.6 ^b
Residue-related products ^a	691.8	727.8	897.8	959.7	1,010.0	849.8	790.5
Plywood and veneer	243.1	152.4	169.3	239.5	86.9	^b	^b
House logs and log homes	22.2	6.2	16.4	29.1	31.7	42.0	8.0
Cedar products	37.3	15.2	22.7	19.5	37.8	37.1	52.9
Posts, poles, and log furniture	47.0	23.7	42.5	36.4	27.6	36.7	38.6
All products	2,475.8	1,730.9	2,023.2	2,278.6	2,048.7	1,830.4^c	1,402.6

^aResidue-related products include particleboard, chips, pulp and paper products, bioenergy products, decorative bark, and mill residues sold within and outside the state.

^bPlywood and veneer sales included with lumber to prevent disclosure of firm level data.

^c2006 Sales value adjusted to reflect facilities not reported previously.

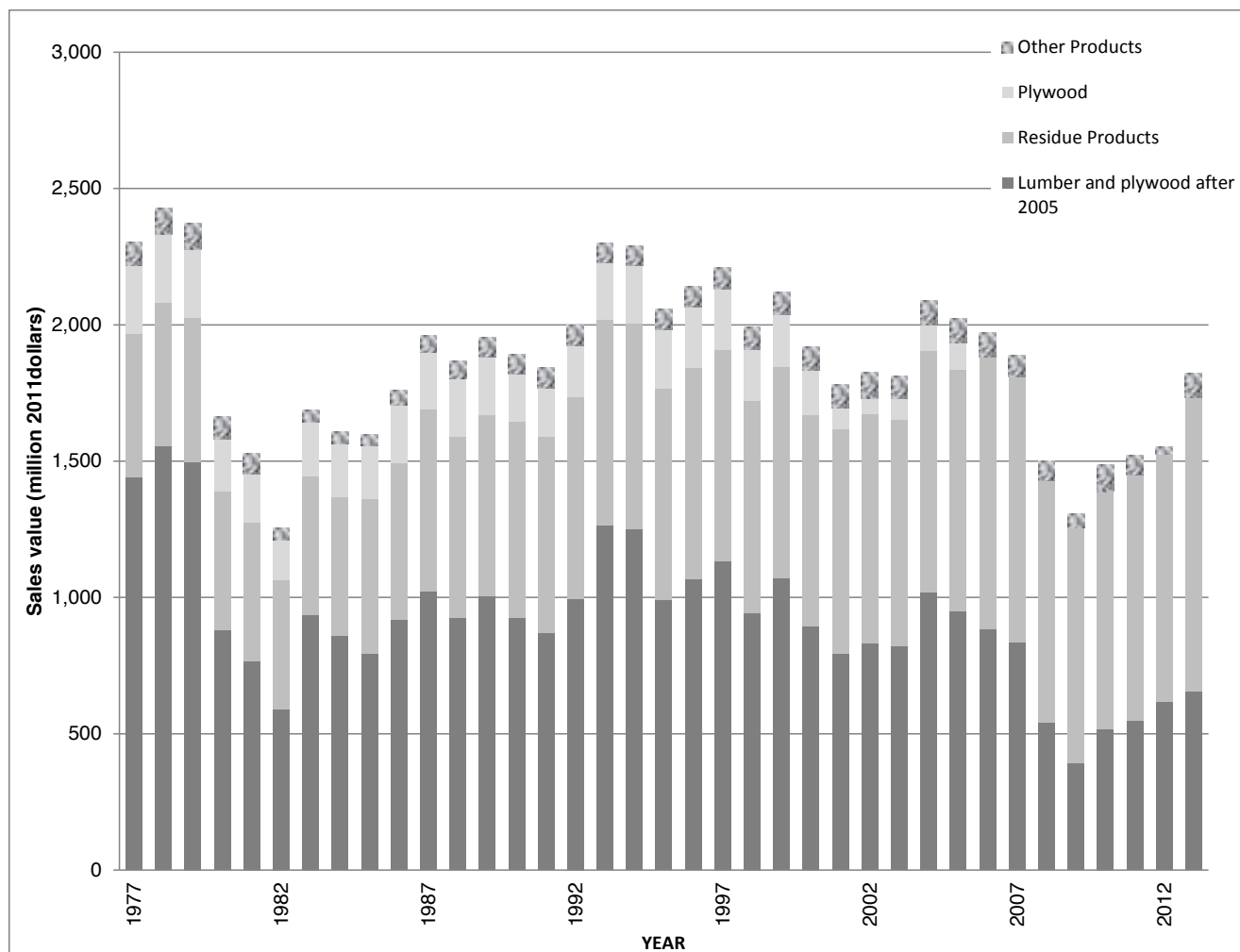


Figure 6—Sales value of Idaho's primary forest products, 1977 through 2013 (sources: WWPA 1977 through 2013; Brandt and others 2012; and Morgan and others 2014).

industry sales in 2011, versus 28 percent in the late 1970s. Part of the increase in the proportion of residue sales is a function of recent weak markets for lumber. As demand for lumber increases, with increased housing starts, lumber should once again account for more than 40 percent of the of primary products sales. Like other sectors of the industry in 2011, residue revenue decreased compared to 2006 with a 7 percent decline in sales value (\$850 million to \$790 million). Sales by the remaining sectors of Idaho's primary wood products industry totaled over \$99.5 million, the highest for any census year and a 4 percent increase over 2006. Unlike the sales for other products that increased from 2006 levels, house log sales dropped drastically.

Timber Received by Idaho Mills

Timber receipts refer to the volume of timber delivered to Idaho mills from in-state and out-of-state sources. Timber receipts for Idaho mills differ from the state's timber harvest because some timber harvested in Idaho was processed in other states, and some of the timber processed in Idaho was harvested outside the state.

Idaho mills received close to 1,073 MMBF Scribner of timber for processing during 2011, a 7 percent (77 MBF) decrease from 2006. Saw and veneer logs constituted the vast majority (89 percent) of Idaho's timber receipts, while logs used for other timber products, including posts and poles, log furniture, pulpwood, and industrial fuelwood, accounted for 8 percent of receipts in 2011. The remaining 3 percent of timber receipts consisted of logs used in cedar products and house logs used by log home manufacturers.

Private lands supplied the majority of each timber product category, except house logs and cedar products. National Forests were the leading supplier of timber to Idaho log home manufacturers and IDL timberlands for cedar products (table 11). Industrial lands were the leading supplier of saw and veneer logs (464 MMBF) and provided the majority of volume (40 MMBF) for other products in 2011.

True firs were the leading species received by Idaho mills in 2011, accounting for nearly 36 percent of receipts followed by Douglas-fir, which accounted for 24 percent of Idaho's timber receipts (table 12). True firs accounted for the largest proportion of sawlogs and veneer logs, as well as other products, while lodgepole pine provided the largest proportion of house log receipts.

Table 11--Idaho timber receipts by ownership class and product, 2011.

Ownership class	Saw and veneer logs ^a	House logs	Cedar products	Other products ^b	All products
<i>----- Thousand board feet, Scribner -----</i>					
Private	581,786	630	13,694	51,789	647,899
Industrial	463,623	489	906	40,929	505,947
Non-industrial private ^c	118,163	141	12,788	10,860	141,952
Public	357,267	1,125	19,461	30,831	408,684
National Forest	77,766	944	2,300	8,706	89,716
State	278,668	181	15,028	21,625	315,502
BLM	833	-	2,133	500	3,466
Canadian and unspecified^d	16,022	105	-	177	16,304
All owners	955,075	1,860	33,155	82,797	1,072,887

^aSaw and veneer logs combined to prevent disclosure of firm level data.

^bOther products include logs used for pulpwood, posts and poles, utility poles, cants, log furniture, and energywood logs.

^cNon-industrial private includes Tribal harvest.

^dIncludes timber receipts from Canada and unspecified out-of-state sources.

Table 12--Idaho timber receipts by species and product, 2011.

Species	Saw and veneer logs ^a	House logs	Cedar products	Other products ^b	All products
<i>----- Thousand board feet, Scribner -----</i>					
True firs	347,108	118	-	35,703	382,929
Douglas-fir	252,543	246	-	5,673	258,463
Western redcedar	98,070	53.9	33,155	13,887	145,166
Ponderosa pine	80,324	62	-	1,380	81,767
Western hemlock	57,548	-	-	21,550	79,098
Western larch	61,732	54	-	485	62,271
Lodgepole pine	28,220	703	-	3,633	32,556
Spruce	16,698	596	-	50	17,344
Western white pine	12,082	27	-	435	12,544
Other species ^b	750	-	-	-	750
All species	955,075	1,860	33,155	82,797	1,072,887
<i>----- Percentage of receipts by product -----</i>					
True firs	36.3	6.36	-	43.1	35.7
Douglas-fir	26.4	13.24	-	6.9	24.1
Western redcedar	10.3	2.90	100	16.8	13.5
Ponderosa pine	8.4	3.35	-	1.7	7.6
Western hemlock	6.0	-	-	26.0	7.4
Western larch	6.5	2.88	-	0.6	5.8
Lodgepole pine	3.0	37.82	-	4.4	3.0
Spruce	1.7	32.02	-	0.1	1.6
Western white pine	1.3	1.43	-	0.5	1.2
Other species ^c	0.1	-	-	-	0.1
All species^d	100	100	100	100	100

^aSaw and veneer logs combined to prevent disclosure of firm level data.

^bOther products include logs used for pulpwood, posts and poles, log furniture, and industrial fuelwood.

^cOther species include: red alder, and other unknown species

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

Sawmill and Plywood/Veneer Sector

Sawmills are the major component of Idaho's primary forest products industry in terms of sales value, number of facilities, and timber volume processed. In 2011, Idaho's 27 active sawmills processed the majority of the timber in the state and produced 1.4 billion board feet of lumber and other sawn products. Idaho's 2011 production represented 5.1 percent of the total U.S. production of softwood lumber (4.9 percent in 2006) and about 3.9 percent of the nation's softwood lumber consumption (2.9 percent in 2006) (WWPA 1964-2013).

The most common species used by Idaho's sawmill sector are Douglas-fir and true firs, with smaller volumes of western hemlock, western larch, western redcedar, ponderosa pine, lodgepole pine, western white pine, and Engelmann spruce. High quality select and shop grades of lumber are produced, as are small volumes of structural timbers, but approximately 87 percent of production is dimension and stud lumber used for construction.

Changes in lumber production—Milling timber into lumber has always been an important part of Idaho's forest products industry with the greatest growth in lumber production occurring after the Second World War. By 1959 the volume of lumber produced in Idaho had nearly doubled from about 1 billion board feet lumber tally in 1947 to almost 1.8 billion (Setzer and Wilson 1970). Idaho's lumber production (fig. 7) clearly shows the influence of markets with a peak in the late 1970s of nearly 2 billion board feet. Lumber production fluctuated in response to timber availability, demand for lumber, changes in mill technology, and use of timber by other sectors over the next two decades and by the late 1990s was around

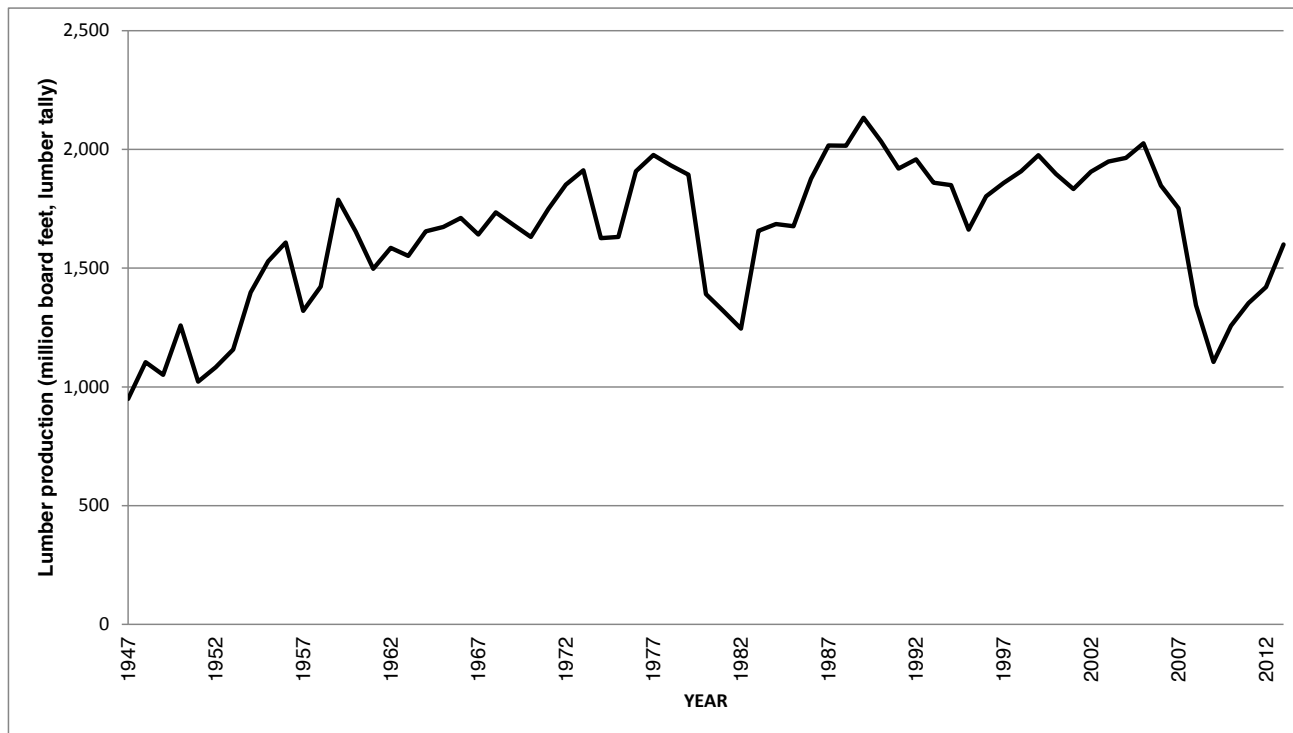


Figure 7—Idaho lumber production, 1947 through 2013 (source: WWPA 1964 through 2013).

2 billion board feet. Between 1999 and 2005, lumber production averaged 1.9 billion board feet annually. In 2001 annual production totaling 1.8 billion board feet was the lowest since 1996. In 2005, annual production of just over 2 billion board feet was the highest since 1990.

Demand for dimensional lumber weakened in 2006 following the housing boom that peaked in 2005 (fig 1). Lumber production in 2006 was 1.85 billion board feet, and by 2009 had fallen 40 percent to just over 1.1 billion board feet, the lowest since 1951. In 2011 lumber production, in response to improved economic conditions, increased to 1.3 billion board feet and has continued to increase to an estimated 1.6 billion board feet for 2013.

Many Idaho sawmills were negatively impacted by falling lumber prices as a result of the downturn in housing. Since 2006 several older mills have closed and two new sawmills were built. Both of the new facilities purchased used equipment to construct their mills. By 2013, both of these mills were closed.

Sawmill lumber recovery and lumber overrun—Product recovery ratios, or the volume of output per unit of input, are a measure of efficiency reported as lumber recovery factors (LRF) and lumber overrun (LO). The LRF is the lumber output in MBF lumber tally divided by the timber input in thousand cubic feet (MCF). Lumber overrun is the amount of lumber actually recovered in excess of the amount predicted by the log scale, expressed as a proportion of the log scale. Although LO is the most commonly quoted measure of lumber recovery/efficiency, LO is a less accurate portrayal of efficiency in lumber output per unit of timber input primarily due to the Scribner log scale. The LRF better illustrates increased lumber output as a function of improvements in technology and sawing techniques (Keegan and others 2010).

Both LO and LRF have shown substantial increases over the past 35 years as shown in figure 8. Lumber overrun increased from 1.30 in 1979 to 1.89 in 2006 (Brandt and others 2012). Lumber recovery factors followed a similar pattern, increasing from about 6.6 board feet lumber tally per cubic foot of sawlog input in 1979 to 8.13 board feet in 2006. The increase in Idaho lumber recovery and overrun since 1979 is due primarily to improved sawing technology with lumber overrun also influenced by the characteristics of the Scribner log rule. The Scribner log rule underestimates the volume of lumber that can be recovered from a log, especially when milling small diameter trees, thus increasing calculated overrun (Keegan and others 2012).

In 2011, Idaho sawmills recovered an average of 1.67 board feet lumber tally per board foot Scribner of input, just under a 12 percent decrease from 2006. The first decline in sawmill overrun in 40 years while LRF increased to 8.33. Decreases in lumber overrun can occur when less small-diameter timber is used to manufacture lumber and when markets are soft for lumber and strong for chips; smaller trees are chipped instead of milled since sawmills frequently favor producing chips instead of milling low grade lumber. In 2011, average quarterly conifer chip prices were at a 3-year high (Random Lengths 2005-2013). The higher chip prices and weak lumber markets likely led sawmills to chip more material rather than mill it into lumber, thus driving LO down.

Lumber production by geographic area—Although lumber production increased each study year from 1995 to 2006, the Great Recession had a dire impact on

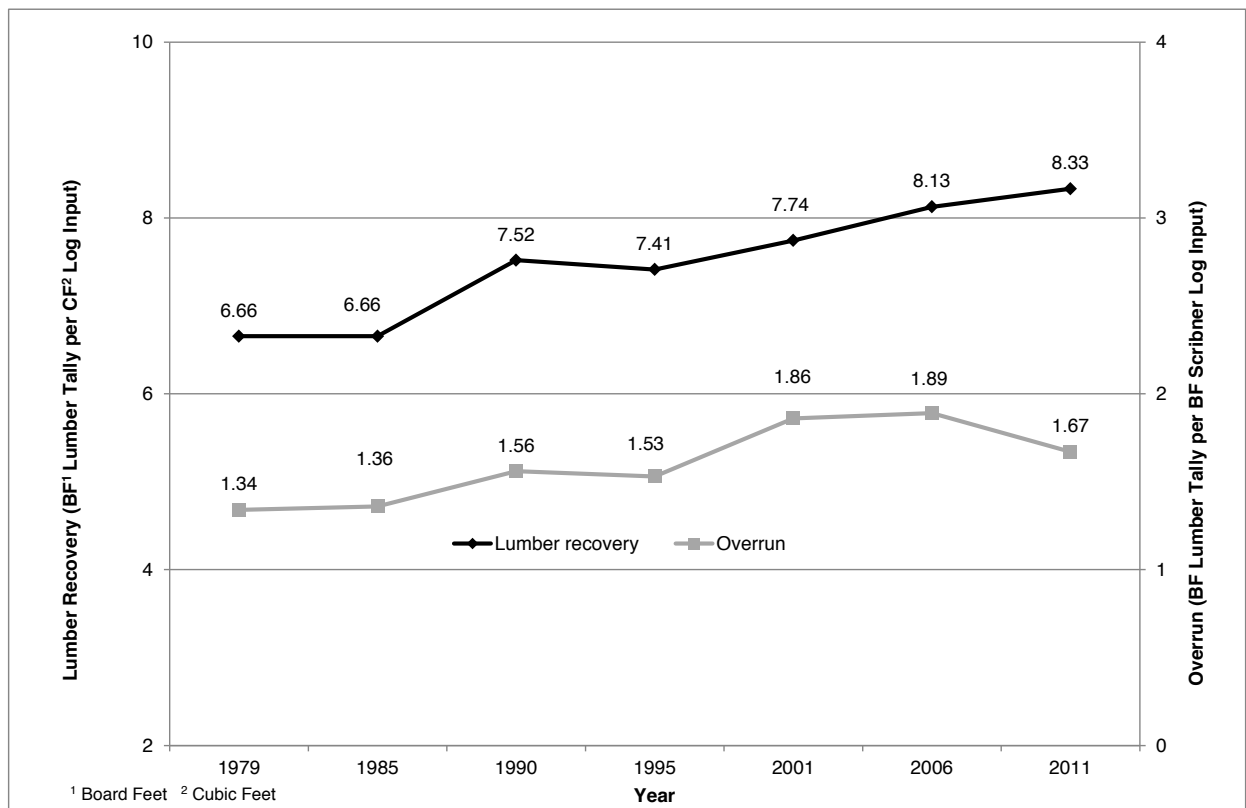


Figure 8—Idaho sawmill lumber recovery and overrun 1979 through 2011 (source: Keegan and others 1997; Morgan and others 2004; Brandt and others 2012).

Idaho's timber industry. Lumber production in Idaho for 2006 was 1,805 MMBF lumber tally, in 2011 it was 1,407 MMBF a 22 percent decrease but has rebounded some to 1,494 MMBF in 2012 (WWPA 1964-2013) (table 13).

County-level lumber production data are withheld for some individual counties to avoid disclosure of firm-level information. Benewah, Bonner, Boundary, Kootenai, and Shoshone counties were Idaho's top lumber producing counties in 2011. This county group produced 769 MMBF, 55 percent of the total lumber production in 2011, but was 63 percent of the total in 2006 (1,214 MMBF). The remaining five counties in Northern Idaho provided 42 percent of Idaho's lumber production, bringing the contribution of Northern Idaho to 97 percent (1,363 MMBF) of total Idaho lumber production in 2011.

The lumber industry in southern Idaho continued the downward trend that began in the late 1980s with a number of sawmill closures. Production in southern Idaho fell 25 percent from 2006 to 2011, and has declined by 88 percent since 1990. Production at mills in southern Idaho, which received more than 75 percent of their timber from National Forests in 1990 and over 60 percent in 1995 (Keegan and others 1992, 1997), were more vulnerable to sharp declines in National Forest timber availability. Boise Cascade permanently closed its timber processing facilities during 2001, citing declines in Federal timber availability as the primary reason for the closures (Boise Cascade 2001).

Number and size of sawmills—The number of sawmills operating in Idaho has continued to decline over the last 50 years as production has become increasingly concentrated into a smaller number of large mills. The average output per mill has increased continually over time to a level tenfold of that in 1956. At 52 MMBF, the average output per mill in 2011 (table 14) was the same as in 2006 and double what it was in 1995 (27 MMBF). Idaho sawmills with a production capacity of over 50 MMBF annually accounted for 86 percent of Idaho's lumber production in 2011 compared to 94 percent in 2006 and just 39 percent in 1995. At the height of the post-World War II housing boom in the 1950s, there were more than 300, mostly small, sawmills in Idaho (table 15). The 2011 mill census identified 27 sawmills, down from 38 in 2006. However, five additional facilities that operated in 2006 were identified, four mills were moved to different sectors based on changing product outputs, and four facilities were inactive during 2011, bringing the number

Table 13--Idaho lumber production by geographic area, selected years (sources: Keegan and others 1997, Morgan and others 2004, Brandt and others 2012).

County group	1979	1985	1990	1995	2001	2006	2011
-----MMBF ^a , lumber tally-----							
Bonner, Boundary, Benewah, Kootenai, Shoshone	930,446	848,930	1,181,555	1,022,002	1,224,991	1,213,987	769,229
Latah, Lewis, Nez Perce, Clearwater, Idaho	609,764	427,425	517,484	422,786	431,288	532,063	593,783
Northern Idaho	1,540,210	1,276,355	1,699,039	1,444,788	1,656,279	1,746,050	1,363,012
Southern Idaho	391,791	389,020	355,511	228,571	102,471	59,063	44,561
Idaho Total	1,932,001	1,665,375	2,054,550	1,673,359	1,758,750	1,805,113	1,407,573

^aMMBF = thousand board feet.

Table 14--Number of active Idaho sawmills by production size class and average annual lumber production, 2011.

Lumber production size class	Number of mills	Percentage of production	Lumber production	Average production per mill
			<i>MBF^a</i>	<i>MBF^a</i>
50+ MMBF ^b	9	86	1,205,972	133,997
10 to 50 MMBF	5	13	189,905	37,981
1 to 10 MMBF	4	1	10,075	2,519
Less than 1 MMBF	9	0	1,621	180
Total	27	100	1,407,573	52,132

^aProduction volume in thousand board feet (MBF) lumber tally.

^bMMBF=million board feet lumber tally.

Table 15--Number of Idaho sawmills by annual lumber production, selected years (sources: Setzer and Wilson 1970; Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Year	Less than 10 MMBF	10 to 50MMBF	Over 50 MMBF	Unknown	Total number of sawmills
1956	274	37	^a	-	311
1962	151	42	^a	-	193
1966	123	45	^a	-	168
1973	67	39	6	10	122
1979	88	31	14	-	133
1985	52	24	14	-	90
1990	40	22	18	-	80
1995	29	17	16	-	62
2001	12	9	14	-	35
2006	18	3	14	-	38
2011	13	5	9	-	27

^aMills with lumber production in excess of 50 million board feet (MMBF) were included in the 10 to 50 MMBF category for these years.

of actual sawmill closures to just five. Of the five closures, two were large mills (capacity of 50+ MMBF), and 3 were mid-sized mills (capacity of between 1 and 50 MMBF). Mid-sized mills have had the most attrition in the last two decades. The loss of several large and medium sized processors prior to 2006 was the result of declining harvest on National Forest lands (Brandt and others 2012). Closures since 2006 have been primarily due to economic conditions created by the Great Recession and U.S. home building collapse (Keegan and others 2012). The 2011 mill census identified 14 mills producing more than 10 MMBF annually, down from 17 in 2006 and the fewest in the last 50 years.

As lumber production has become increasingly concentrated into larger facilities, ownership of the facilities has also consolidated as a result of several mergers of large forest products companies in Idaho. In 2008, Riley Creek Lumber and Bennett Forest Industries merged to become Idaho Forest Group (IFG) further consolidating the major sawmills in Idaho. Several mills changed names and ownership between 2006 and 2012, mostly along the Clearwater River. The Three

Rivers Sawmill became Blue North, Tri Pro Forest Products purchased Konkoville Lumber, and the Potlatch Sawmill in Lewiston went to Clearwater Paper and was eventually sold to IFG. In St. Maries, Stimson Lumber Company purchased the Regulus Stud mill. Even though mills have closed since 2006, an attitude of optimism is reflected by the fact that several large facilities have made major capital improvements in the last 3 years despite challenging market conditions and slow recovery of U.S. housing starts (Morgan and others 2013 and 2014).

Plywood and Veneer mills—During the late 1950s and early 1960s, two plants producing plywood and veneer operated in Idaho with combined total production of less than 50 million square feet (MMSF) annually. By 1979, eight plants producing structural panels or veneer were operating in Idaho producing between 500 and 600 MMSF annually. With the addition of an oriented strand board (OSB) plant in 1984 the number of active plants in Idaho rose to six. Production peaked in 1988 at 639 MMSF. The period from 1985 to 1995 was marked by stability in both the number of plants operating and production levels. All six plants operating in 1985 were still operating in 1995, and production remained stable at approximately 600 MMSF per year. In the late 1990s, the structural panel sector began a period of significant decline. The OSB plant closed in 1997, and a plywood plant closed in 2000, reducing the number of active structural panel plants operating in Idaho to four. Another plywood plant closed in 2001. The closures since 1995 were due primarily to reduced timber availability, as well as increased competition from OSB and plywood producers elsewhere in North America and overseas. In 2011, only two plywood/veneer facilities remained in Idaho.

The combined harvest of saw and veneer logs in 2011 was 944 MMBF Scribner, 8 percent lower than 2006, 32 percent lower than 1995, and 40 percent lower than 1990. Reduced competition for timber from the plywood/veneer sector, advancements in sawmilling technology and fluctuating market conditions between 1990 and 2011 increased the proportion of the timber harvest utilized for lumber production. These factors have been the primary influences that have sustained lumber production in Idaho, while causing a substantial reduction of Idaho's plywood industry.

Residue-Related Products Sector

In addition to products such as lumber and plywood, the processing of timber generates substantial volumes of wood fiber by-products. These by-products, referred to as mill residue, are the raw material source for the residue-related products sector. The 2011 mill census identified a total of 18 facilities in this sector. The residue-related products sector includes a pulp and paperboard plant, a consumer tissue products plant, a particleboard plant, three wood fuel pellet producers, five facilities generating steam or electricity, two whole-log chipping facilities, and five facilities producing bark-related products such as decorative landscaping material.

The total sales from the residue-related sector were nearly \$790 million in 2011, down 7 percent from 2006 (\$849 million in constant 2011 dollars). This sector remains a substantial part of Idaho's forest products industry, accounting for approximately 56 percent of Idaho's primary forest products sales in 2011, compared to just 28 percent in 1979. The five facilities processing residues for landscape,

mulch and animal bedding products accounted for approximately 5 percent of the sales value in this sector. Remaining sales came from pulp and paper, chipping facilities, biomass plants, and heating products (pellets, compressed logs). In this sector, Idaho has several one-of-a-kind facilities, thus plant level data have been pooled to prevent disclosure of individual plant information.

Several Idaho firms operate plants producing energy from the burning of wood residue. Most of these plants are associated with timber processing facilities and historically produced steam energy for in-house use. Some of these plants began to produce electricity for sale to outside markets in the early 1980s. The largest biomass to energy plant in Idaho is located at the University of Idaho and supplies the entire campus with steam heat by burning chipped logs and municipal wood waste. One public school has a wood-fired heating system and participates in the fuels for schools program while another burns commercial wood pellets.

Other Primary Manufacturers

In 2011, 41 (down from 55 in 2006) other primary manufacturers were identified that processed timber into cedar products, log homes, utility poles, posts, and other small roundwood products such as corral poles, tree stakes, and round wood log furniture (table 9). These facilities processed nearly 11 percent (117.8 MMBF) of the timber received by Idaho facilities during 2011 and accounted for 7 percent (\$99.5 million) of the primary industry's total sales value, including mill residue and residue related products.

Posts, poles, utility poles, and log furniture—In 2011, 17 plants in Idaho manufactured various types of roundwood products, such as utility poles, posts, corral poles, and log furniture. A few log furniture and post/pole facilities have closed since 2006, two sawmills were reclassified into this category because their product mix changed, and two additional utility pole facilities were identified. Utility poles accounted for 78 percent of roundwood inputs and 77 percent of the total sales value in this category. By the end of 2012, McFarland Cascade's decades long association with Idaho ended as Stella Jones purchased the company, consolidating the entities operating in this sector. Over the last two decades, this portion of the industry has shown a great deal of stability in its contribution to the wood products economy of Idaho. With a little more than half the number of facilities of 1995, 2011 sales value was 17 percent higher than 1995 (\$38.6 million versus \$32.9 million) and the highest for any study year since 1990 (table 10).

Cedar products—Eight cedar products facilities operated in Idaho during 2011, the same as in 2006. Cedar product manufacturers processed 30 MMBF in 2011, 25 percent more than in 2006 (24 MMBF). Since 1979, the number of manufacturers for cedar products such as cedar shakes, shingles, split rail fencing, and fence lath in Idaho has steadily declined. Even so, the sales value of cedar products reached an all-time high in 2011. At nearly \$53 million (table 10), 2011's sales were 42 percent higher than 2006, and 171 percent higher than 1995. Much of this growth was in cedar fencing products (split cedar posts, rails, and fencing boards). In 2011, at a time of depressed lumber prices and sluggish housing starts, demand for wood products used in repair (shakes) and enhancing the value of existing housing (cedar fencing) likely contributed to the record sales volume and value.

Idaho's cedar products processors remain an important economic influence. With only a fraction of the facilities that were operating in 1979, sales values have risen 43 percent in constant dollars.

Log homes/house logs—The log home industry was impacted more severely than any other primary sector. In recent years, log home sales have been primarily for high end recreation properties and second homes, markets which were severely impacted by the Great Recession (Morgan and others 2011.)

During 2011, there were 16 active log home facilities, ten fewer than in 2006. Sales value (adjusted for inflation) fell from its 2006 high (\$42 million) to just \$8 million, an 81 percent decrease, and the lowest since 1985 (\$6.2 million). Timber receipts for house logs fell from 17 MMBF in 2006 to 1.8 MMBF in 2011. Production of house logs dropped from 3.2 million lineal feet to 547 thousand lineal feet. Many of the facilities that have survived the effects of the Great Recession have done so by producing other products such as posts, poles, timbers, and kits for small log buildings. A few facilities switched from processing logs and building homes to selling and assembling pre-manufactured log homes or kits from other companies. While the log home industry accounts for only a small fraction of Idaho's primary wood products industry, these facilities are labor intensive and add a great deal of value to the log with relatively low capital investment. Since the industry can expand rather easily due to the low capital investment, recovery will likely depend on the recreation and second home markets, which will probably improve at a slower rate than other construction markets.

Plant Capacity

This section examines production capacity and estimates the timber-processing capacity and the proportion of that capacity utilized by Idaho's primary forest products manufacturers in 2011. The analysis focuses on plants processing sawtimber—sawmills, plywood and veneer plants, house log plants, and utility pole plants. Capacity and utilization for the non-sawtimber processing manufacturers are discussed in less detail.

Mills were asked to specify production capacity-volume of finished product the facility is capable of producing both per eight-hour shift and annually given sufficient supplies of raw materials and firm market demand for products. Most of the larger mills estimated annual capacity based on two 8- or 10-hour shifts daily for 220 to 260 operating days per year. A few facilities estimated annual capacity at 24 hours per day for 220 to 250 days. Smaller mills reported annual capacity at one shift per day for 250 operating days or less per year.

Sawtimber processors reported production capacity in a variety of units. Sawmills reported production capacity in thousand board feet (MBF), lumber tally, while plywood capacity was reported in thousand square feet (MSF) on a 3/8-inch basis. Utility pole production capacity was reported in numbers of pieces of a given size, and house log capacity in lineal feet. To combine the production capacity figures from different sectors and estimate the industry's total capacity to process sawtimber, production capacity was converted to units

of timber input (MMBF Scribner) on a mill-by-mill basis, using each facility's product recovery factor.

Timber processing capacity for sawmills was calculated by dividing lumber production capacity by each mill's lumber recovery. Plywood and veneer capacity figures were converted to MMBF Scribner by dividing production capacity in square feet by each mill's plywood recovery. Utility pole and house log capacities were adjusted to MMBF Scribner by multiplying capacity in the given finished product unit by an average Scribner board foot volume per piece or per lineal foot.

Estimates of mill capacities to process sawtimber and the utilization of total capacity for 1979, 1985, 1990, 1995, 2001, and 2006 are based on complete forest products industry censuses of Idaho's industry. For non-census years, mill capacities and utilization were estimated using information from industry directories, trade associations, and industry consultants (Random Lengths 2001-2013; WWPA 1964-2013; Keegan and others 2006; Spelter and others 2009; Ehinger 2012). Detailed capacity information is not available prior to the 1979 mill census. Idaho's sawtimber processing capacity has declined by 38 percent since 1979, with most of the decline occurring after 1990 (fig. 9). In 2003, several mill closures reduced capacity to less than 1,150 MMBF. The 2006 study found that capacity to process timber actually increased from 2001. Idaho's Sawtimber processing capacity in 2011 was 1,287 MMBF down 4 percent (55 MMBF) from 2006 (1,342).

Sawtimber Capacity and Utilization by Sector

Both capacity to process sawtimber and capacity utilization declined slightly in 2011 from 2006. Idaho mills processed 914 MMBF Scribner of saw timber, utilizing 71 percent of the state's capacity, the lowest level of utilization for any mill census year (table 16). Utilization peaked in 1990 at 90 percent then dropped to less than 84 percent. Since 2011, a few large mills have made significant investments in upgrading milling technologies and two mills were permanently closed and dismantled. Sawtimber processing capacity was estimated to have increased from 1,287 to 1,555 MMBF by the end of 2013.

Idaho's overall capacity and utilization trend closely with the state's sawmill and plywood/veneer industries, which accounted for 97 percent of sawtimber processing capacity in 2011 and has been between 97 and 98 percent for each study year except 1990 when it was 95 percent. The combined sawtimber capacity of sawmills and plywood and veneer plants in 2011 was 1,256 MMBF, down from 1,304 MMBF in 2006 and 31 percent less than in 1979 (1,809 MMBF). Capacity utilization for 2011 declined from 79 percent in 2006 to 72 percent.

In 2011, two utility pole plants that were operating but not captured in 2006 were added to the mill census. Adjustments in capacity and utilization were made to the 2006 data. The annual timber processing capacity of Idaho's utility pole and house log sectors in 2011 was 31 MMBF, 19 percent (7 MMBF) lower than in 2006 (38 MMBF). In 2011, only 35 percent of the capacity was utilized compared to 55 percent in 2006. This decrease can be attributed to the collapse of the log home market in conjunction with the Great Recession.

Table 16--Estimated capacity to process sawtimber and capacity utilized for sawmills, plywood/veneer plants, utility pole and house log plants, in Idaho, selected years (sources: Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Plant type	Capacity to process sawtimber	Volume processed	Percentage of total capacity utilized
----- MMBF ^a , Scribner -----			
1979			
Sawmills	1,809	1,437	79
Plywood/veneer plants	221	210	95
Utility pole and house log plants	33	20	61
Total	2,063	1,667	81
1985			
Sawmills	1,666	1,229	74
Plywood/veneer plants	265	208	78
Utility pole and house log plants	34	15	44
Total	1,965	1,452	74
1990			
Sawmills	1,459	1,316	90
Plywood/veneer plants	227	214	94
Utility pole and house log plants	31	14	45
Total	1,771	1,544	90
1995			
Sawmills	1,318	1,097	83
Plywood/veneer plants	202	184	91
Utility pole and house log plants	41	20	49
Total	1,562	1,301	83
2001			
Sawmills	1,140	948	83
Plywood/veneer plants	126	72	57
Utility pole and house log plants	28	16	57
Total	1,294	1,036	80
2006^c			
Sawmills and plywood/veneer plants	1,304	1,024	79
Plywood/veneer plants	b	b	b
Utility pole and house log plants	38	21	55
Total	1,342	1,045	78
2011			
Sawmills and plywood/veneer plants	1,256	903	72
Plywood/veneer plants	b	b	b
Utility pole and house log plants	31	10	33
Total	1,287	914	71

^aMMBF = million board feet.

^bPlywood and veneer figures included with lumber to prevent disclosure of firm level data.

^c2006 numbers updated to reflect facilities not reported previously

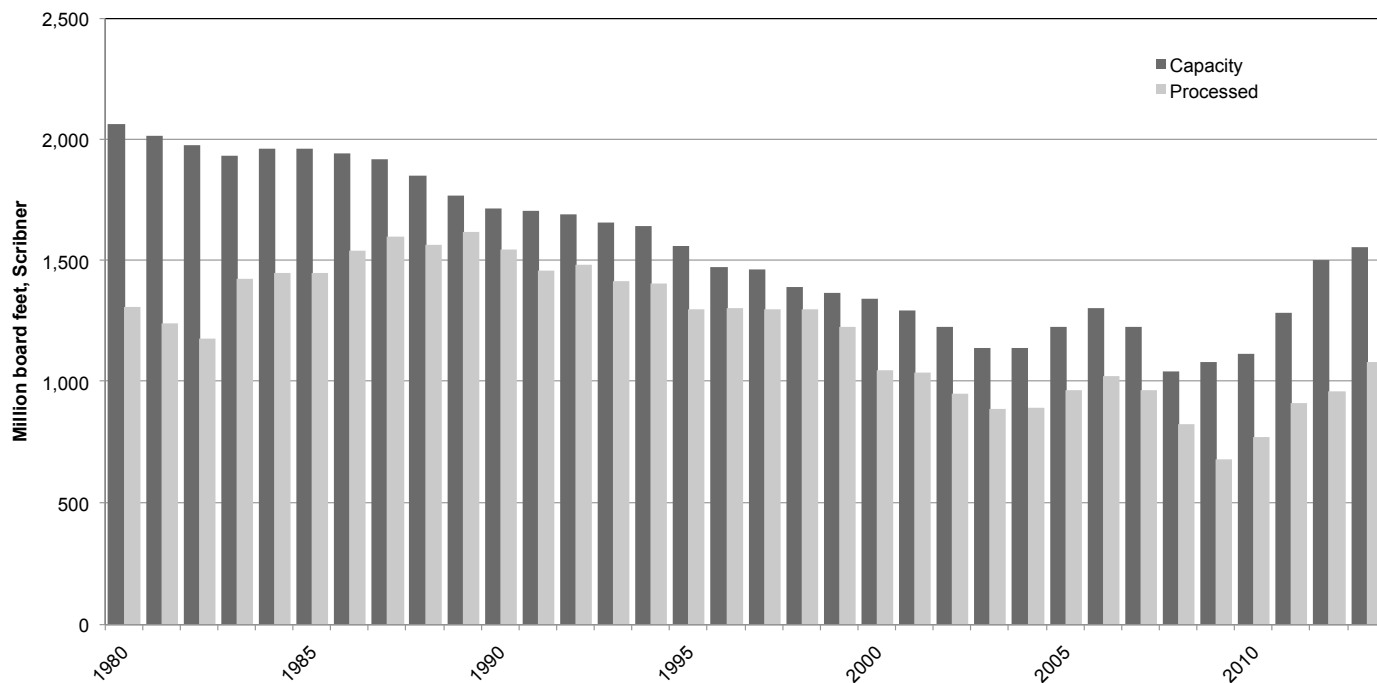


Figure 9—Idaho sawtimber processing capacity and sawtimber processed, 1979 through 2013 (source: Keegan and others 1997; Morgan and others 2004; Brandt and others 2012).

Markets for Primary Wood Products

This chapter examines the markets for Idaho’s primary forest products excluding mill residue and residue related products. Respondent mills summarized their 2011 shipments of finished wood products, providing information on volume, sales value, and geographic destination (fig. 10). Mills usually distributed their products through their own distribution channels or through independent wholesalers and selling agents. Because of subsequent wholesaling transactions, the geographic destination reported may not precisely reflect final delivery points of shipments.

All sales, including mill residue and residue related products totaled \$1.4 billion in 2011. Excluding mill residues and sales by the residue-utilizing sector, sales from Idaho’s primary wood products industry totaled \$612 million in 2011, down 36 percent from 2006, and 41 percent from 2001.

The major market areas for Idaho’s primary wood products remain the Rocky Mountain, Far West, and the North Central states. Nearly 80 percent of Idaho’s 2011 primary wood product sales occurred in four market areas: the South, Far West, Rocky Mountain, and North Central states (table 17). Between 2006 and 2011, inflation adjusted sales decreased to every region except the South and other countries. Sales to the South increased by 13 percent from \$71 million in 2006 to \$80 million in 2011, while export sales to other countries increased 42 percent from \$12 million to \$17 million for the same period, the highest since 1990. Decreases in sales values for all of the other regions ranged from 29 to 53 percent, with the largest decrease to in-state sales.

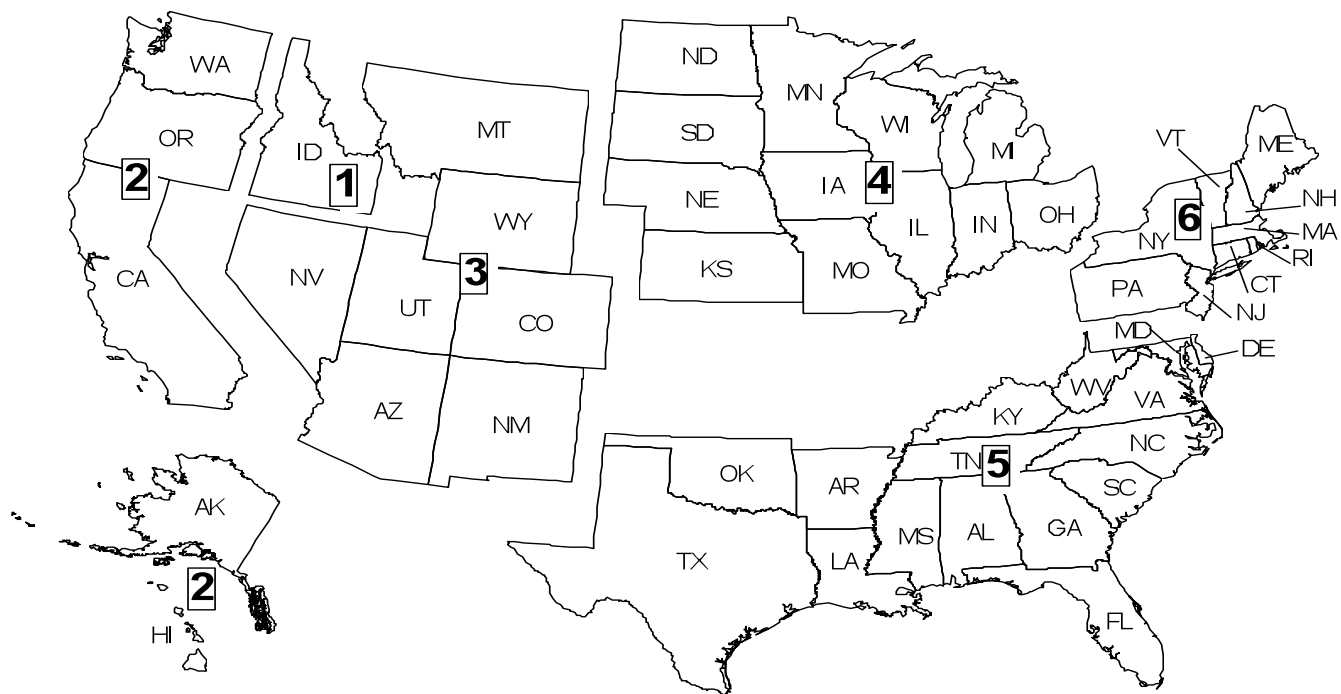


Figure 10—Shipment destinations for Idaho's primary wood products. Regions are Idaho (1), Far West (2), Rocky Mountain (3), North-Central (4), South (5), and Northeast (6).

Table 17--Destination and value of Idaho's 2011 primary wood products sales^a. All values in 2011 dollars.(sources: Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Product	Idaho	Rocky Mountain	Far West	North-Central	Northeast	South	Other countries	Unknown	Total
----- Sales value in thousand 2011 dollars-----									
Lumber, timbers, other sawn products, plywood and veneer ^b	42,413	121,217	85,688	153,883	42,313	56,397	10,723	-	512,634
Posts, poles, and log furniture	11,413	1,357	19,643	200	150	-	5,866	-	38,629
House logs and log homes	2,408	2,478	777	1,179	573	120	422	-	7,957
Cedar products	6,163	10,282	9,672	2,354	1,120	23,299	16	-	52,906
2011 All products total	62,397	135,334	115,780	157,616	44,156	79,816	17,027	-	612,126
2006 Total	130,785	260,002	201,453	221,563	63,680	70,843	11,901	-	960,227
2001 Total	147,914	238,145	249,916	204,378	105,173	76,950	16,016	-	1,038,491
1995 Total	254,682	291,472	235,546	291,892	125,385	107,184	12,705	-	1,318,864
1990 Total	150,021	146,221	215,887	271,645	179,321	119,611	18,181	24,604	1,125,490
1985 Total	105,671	180,501	142,002	210,515	132,803	123,379	2,414	105,870	1,003,156
1979 Total	190,409	362,891	160,847	452,283	183,583	186,616	17,873	229,364	1,783,866
----- Percentage of total sales value by product -----									
Lumber, timbers, other sawn products, plywood and veneer ^b	8	24	17	30	8	11	2	-	83.7
Posts, poles, and log furniture	30	4	51	1	c	c	15	-	6.3
House logs and log homes	30	31	10	15	7	2	5	-	1.3
Cedar products	12	19	18	4	2	44	0	-	8.6
2011 All products total	10	22	19	26	7	13	3	-	100
2006 Total	14	27	21	23	7	7	1	-	100
2001 Total	14	23	24	20	10	7	2	0	100
1995 Total	19	22	18	22	10	8	1	0	100
1990 Total	13	13	19	24	16	11	2	2	100
1985 Total	11	18	14	21	13	12	0	11	100
1979 Total	11	20	9	25	10	10	1	13	100

^aDoes not include mill residue sales or sales by the residue-utilizing sector.

^bLumber, timbers, and other sawn products includes plywood and veneer sales value to prevent disclosure of firm level data.

^cLess than .05 percent.

Market Areas by Finished Product Type

Sales of Idaho's plywood, veneer, lumber, timbers, and other sawn products totaled just under \$513 million and accounted for 84 percent of all wood products sales in 2011 (table 17). Sales values decreased from 2006 levels to all regions except to other countries, which increased by 24 percent. Idaho was 8 percent of total sales in 2011 and 13 percent of sales in 2006. Idaho, the Rocky Mountain States, and the Far West combined were 49 percent of total sales in 2011, down from 62 percent in 2006. The North Central, Northeast, and the South were 49 percent of 2011 sales, up from 37 percent in 2006.

Cedar products (including cedar shakes, shingles, and split rail fencing) generated about \$53 million and almost 9 percent of total sales in 2011. Sales increased in all regions except the North Central, Northeast, and to other countries. Idaho had 12 percent of the sales for cedar products in 2011 and 6 percent in 2006. The Rocky Mountain States with Idaho and the Far West States accounted for 49 percent of cedar sales, up from 30 percent in 2006. Sales to the South were almost the same as in 2006 at 44 percent. The North Central States had the biggest change since 2006 dropping from 20 percent to only 4 percent of total sales. Virtually no cedar products were exported to other countries.

Post, poles, and log furniture accounted for nearly \$39 million and 6 percent of total sales during 2011. Sales in-state were 29 percent of this sectors sales in 2011 and 24 percent in 2006. Idaho, the Rocky Mountain States, and the Far West States comprised 84 percent of total sales, about equal to 2006 (83 percent). Sales in 2011 for this sector to other countries were 15 percent, up 5 percent from 2006. The North Central States fell from 6 percent of total sales in 2006 to 1 percent in 2011.

Log home and house log manufacturers generated only \$8 million and just 1 percent of total sales in 2011. Sales in this sector dropped in every region with the smallest decrease in sales to other countries. Sales in-state were 30 percent of total sales in this sector, up from 24 percent in 2006. Idaho, the other Rocky Mountain States, the Far West, and the North Central States, were still the major markets for these products, comprising 86 percent of total sales in 2011 and 84 percent in 2006. Sales to the Northeast, South, and other countries were the remaining 14 percent increasing from 5 percent in 2006. The Rocky Mountain States had the largest decrease in the percentage of sales, dropping from 46 percent in 2006 to 31 percent in 2011.

Mill Residue: Types, Quality, and Use

Wood fiber residue from primary wood products manufacturers (mill residue) is the major source of raw material for Idaho's pulp and paper and board industry, and an important source of fuel for all major sectors of the wood products industry. If not used, wood residue can create difficult and expensive disposal problems. Sawmills and plywood plants consistently generate over 90 percent of the mill residue produced by Idaho's forest products industry.

Sawmill and Veneer/Plywood Residue

Three general types of wood fiber residue are generated by Idaho's sawmills and plywood plants. The largest pieces are coarse or chippable residue consisting of slabs, edgings, and trimmings from lumber manufacturing; log ends; pieces of veneer not suitable for manufacturing plywood and plywood plant peeler cores not sawn into lumber. Then there is fine residue consisting of planer shavings and sawdust from sawmills, sander dust from plywood plants, and finally bark.

Respondents to the 2011 survey provided information on volume of residue generated, sales value, and uses. Residue volumes were reported in bone-dry units (BDU). A bone-dry unit equals 2,400 pounds of wood, oven-dry weight. In addition to residue quantity and disposition, statewide residue factors, which quantify the number of bone dry units of residue generated per MBF of lumber produced, were updated for Idaho sawmills based on the 2011 mill census (table 18).

Idaho sawmills and plywood plants generated an estimated 1,279 thousand bone-dry units (MBDU) of manufacturing residue in 2011, 1,519 in 2006, and 1,751 MBDU in 2001 (table 19). The decrease in residue generated since 1990 resulted from a combination of decreasing volumes of timber being processed and improving technology. With computer guided saws, thinner kerf saws, better planers, and better plywood lathes, technological improvements have led to lower residue volumes per unit of mill output through time (Keegan and others 2012).

Table 18 --Idaho sawmill residue factors, selected years (source: Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Type of residue	1979	1985	1990	1995	2001	2006	2011
----- BDU per MBF lumber tally ^a -----							
Coarse	0.47	0.53	0.43	0.45	0.42	0.39	0.38
Sawdust	0.25	0.21	0.18	0.18	0.17	0.15	0.13
Planer shavings	0.22	0.20	0.15	0.15	0.13	0.09	0.08
Bark	0.30	0.19	0.18	0.18	0.20	0.20	0.23
Total	1.24	1.13	0.94	0.96	0.92	0.83	0.82

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

Table 19 --Volume of wood residue generated by Idaho sawmills and plywood/veneer plants, 2011.

Residue type	Wood residue			Percentage of type		Percentage of total
	Used	Unused	Total	Used	Unused	
	----- Bone-dry units ^a -----			----- Percent of total -----		
Coarse	590,993	86	591,079	99.99	0.01	46
Fine ^b	330,026	48	330,074	99.99	0.01	26
Bark	357,954	199	358,153	99.94	0.06	28
Total	1,278,973	333	1,279,306	99.97	0.03	100

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

^bFine residue includes sawdust and planer shavings.

The proportion of manufacturing residue that is utilized has increased steadily since 1979, to the point that since 2001 virtually all (over 99 percent) of the residue produced has been used. Largely because of pulp and paper industry expansion and the opening of particleboard plants in the region, but also because of the increasing use of wood residue as a fuel to dry lumber and veneer, to generate electricity, and provide heat. In 1979, 89 percent of mill residue was used, increasing to 99 percent by 1995, and nearly 100 percent since 2001 (table 20).

Coarse residue comprised the largest share of residues in 2011. Mills produced 591 MBDU, with nearly 100 percent utilized. Pulp and paper mills in Idaho and other states received 572 MBDU, with 19 MBDU going to other uses, primarily internal energy use. Less than 1 MBDU of coarse residue were unused in 2011.

Of the 330 MBDU of fine residue used, over 94 percent (312 MBDU) went to pulp and paper mills or board plants for use as a raw material, 17 MBDU were consumed as fuel, and a little over 1 MBDU went for other uses such as animal bedding, mulch, and raw material for other products.

Use of bark has increased dramatically since 1979 when only 73 percent was utilized. Nearly 100 percent of bark residue has been utilized since 2001. Of the 358 MBDU produced in 2011, 283 MBDU were consumed as fuel, 2 MBDU were used for miscellaneous products including decorative bark, livestock bedding, and mulch; less than 1 MBDU went unused. The amount of bark used as hog fuel declined from 2006 to 2011 while bark used for other products increased. Some of the change in bark utilization is due to bark previously being reported as hog fuel when it was used for decorative bark. Today, bark is usually more valuable for other products such as landscaping material than hog fuel.

Table 20 --Production and disposition of residues by sawmills and plywood/veneer plants, various years (sources: Keegan and others 1997, Morgan and others 2004, Brandt and others 2012).

Type of Residue	Total Utilized	Reconstituted Products	Hogfuel	Other Uses	Unused	Total
----- Thousand Bone Dry Units ^a -----						
Coarse						
1979	987	957	10	20	21	1,008
1985	976	930	28	18	14	990
1990	1001	988	0	13	5	1,006
1995	885	872	3	10	1	886
2001 ^c	806	773	30	3	3	810
2006	735	639	86	10	^b	735
2011	591	572	18	1	^b	591
Sawdust						
1979	399	197	164	38	58	457
1985	308	176	115	17	22	330
1990	365	175	167	23	13	378
1995	306	158	133	15	4	310
2001	237	80	148	9	-	237
2006	266	224	40	2	^b	266
2011	212	206	5	1	^b	212
Planer Shavings						
1979	340	215	112	13	20	360
1985	288	128	155	5	17	305
1990	310	221	88	1	9	319
1995	250	130	113	7	8	258
2001	307	193	113	1	^b	307
2006	161	125	34	2	^b	161
2011	118	106	12	^b	^b	118
Bark						
1979	473	-	429	44	174	647
1985	282	-	263	19	73	355
1990	395	-	344	51	19	414
1995	358	-	343	15	10	368
2001	401	-	384	17	^b	401
2006	357	-	333	24	^b	357
2011	358	-	283	75 ^d	^b	358
Total						
1979	2,199	1,369	715	115	273	2,472
1985	1,854	1,234	561	59	126	1,980
1990	2,071	1,384	599	88	46	2,117
1995	1,799	1,160	592	47	23	1,822
2001 ^c	1,751	1,046	675	30	3	1,755
2006	1,519	988	493	38	^b	1,519
2011	1,279	884	318	77	^b	1,279

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

^bLess than 1,000 bone dry units.

^cnumbers do not sum to total due to rounding.

Residues from Other Manufacturers

The manufacture of utility poles, house logs, cedar products, posts, small poles, roundwood chips, and roundwood furniture generates several types of residue, including bark, shavings and peelings, log ends, cull portions of logs, and slabs from log home manufacturers. In 2011, about 94 MBDU of these residues were produced, and just over 92 percent of this volume was used. Uses of these residues include livestock bedding, garden mulch, firewood, or other fuel.

The Forest Products Industry and the Idaho Economy

This section discusses employment and worker earnings trends in Idaho's primary and secondary forest products industry as well as the industry's place in the economy of Idaho and northern Idaho. This analysis focuses on 2011 and 2012, the most recent years for which comprehensive state and county economic data are available.

The primary forest products industry includes logging, processing logs into lumber and other wood products, processing wood residues into outputs such as paper or electricity, and private-sector timber management services. The secondary industry¹, as defined in this report, includes the further processing of the outputs from the primary industry manufacturers either from Idaho or elsewhere. Portions of the secondary industry, such as truss and cut-stock manufacturers are directly linked and highly integrated with Idaho's primary industry. Other components such as mobile home manufacturers have limited links to and dependence on Idaho's primary industry.

Data from several sources were used to identify employment and workers earnings for Idaho's primary and secondary forest products industry. Sources included the U.S. Department of Commerce, Regional Economic Information System (REIS; U.S. Department of Commerce 2012), along with wage and salary data from the U.S. Department of Labor, Bureau of Labor Statistics (U.S. Department of Labor 2013), and the U.S. Census Bureau's County Business Patterns (U.S. Census Bureau 2013). Additional information from the Idaho Department of Labor and from the periodic facilities censuses of the industry done by the Bureau of Business and Economic Research as part of the FIDACS system (Keegan and others 1982, 1988, 1992, 1997; Morgan and others 2004; Brandt and others 2012).

Most of the primary and secondary industry is reported in four North American Industrial Classification (NAICS) sectors, as defined by the U.S. Office of Management and Budget (OMB 1998):

- 113—forestry and logging;
- 1153—support activities for forestry;
- 321—wood products manufacturing;
- 322—paper manufacturing.

¹ Secondary industries include but are not limited to; wood treatment plants, cabinet shops, molding, doors and window manufacturers, re-manufacturers, and pallet manufacturers.

These classifications were used to estimate total employment and workers' earnings (workers earnings) in Idaho's forest products industry. This grouping of industry categories provides a conservative measure of the forest products or wood and paper products industry. However, a number of activities are not included in these classifications, including the hauling of logs by independent truckers; hauling of finished products by truck, rail or barge; and forest management activities by government employees. Additionally, a portion of the secondary industry—the manufacturing of wood furniture—is found in NAICS 337.

Based on these classifications, approximately 10,041 workers, earning over \$535 million (in 2011 dollars), were employed in the forest products industry in Idaho in 2011. The primary sectors accounted for approximately 6,440 workers, while the secondary sectors employed the remaining 3,600.

Trends in Forest Products Employment and Workers Earnings

This section focuses on trends in Idaho forest industry employment since 1990; a discussion of longer term trends is in Morgan and others (2004), and Brandt and others (2012).

The wood and paper products industry is a substantial and relatively high paying industry in Idaho. Even with the severe economic conditions of the last several years, Idaho's industry directly employed nearly 10,320 workers in 2012, an increase of 279 jobs from 2011. The operations of the industry and the multiplier effect of workers' spending and re-spending support jobs in other sectors of Idaho's economy (Cook and O'Laughlin, 2006). Of every 10 jobs in the forest products industry, spending supports seven jobs in other industries (Morgan and others 2014). In addition to generating considerable employment in other sectors, wood and paper employees earned an average of \$52,000 in workers earnings/labor income for 2012; this is substantially more than the state average of \$36,900 per worker.

Since 1990, the number of workers in Idaho's forest products industry peaked at around 19,000 in 1994. By 2001, economic challenges associated with the September 11th terrorist attacks, declining timber harvest volume, and the closure of four large sawmills (Ehinger 2012) had caused employment to fall to 14,200 (figure 11). From 2002 to 2007, employment fluctuated between 14,000 and 14,500. The economic collapse associated with the Great Recession precipitated the next large drop when employment fell from 14,300 in 2007 to 9,600 in 2010. Employment has risen with the slow economic recovery since 2010, with 2013 employment estimated at 10,500.

Idaho's primary and secondary industries reveal substantially different trends in employment. Primary employment dropped from 15,122 in 1990 to just 9,300 in 2006 and to 6,440 in 2011. The major factors leading to the long-term decline in the industry, especially primary industry employment, was the nearly 35 percent decline in timber harvest between 1990 and 2006 driven by an 80 percent decline in the Federal timber sale program in Idaho. The collapse of the U.S housing market impacted Idaho's primary industry beginning in 2006 and contributed greatly to drops in 2007 and 2008. Since the depth of the Great Recession in 2009, timber harvests volume, lumber production, and employment have steadily but slowly increased (fig. 12).

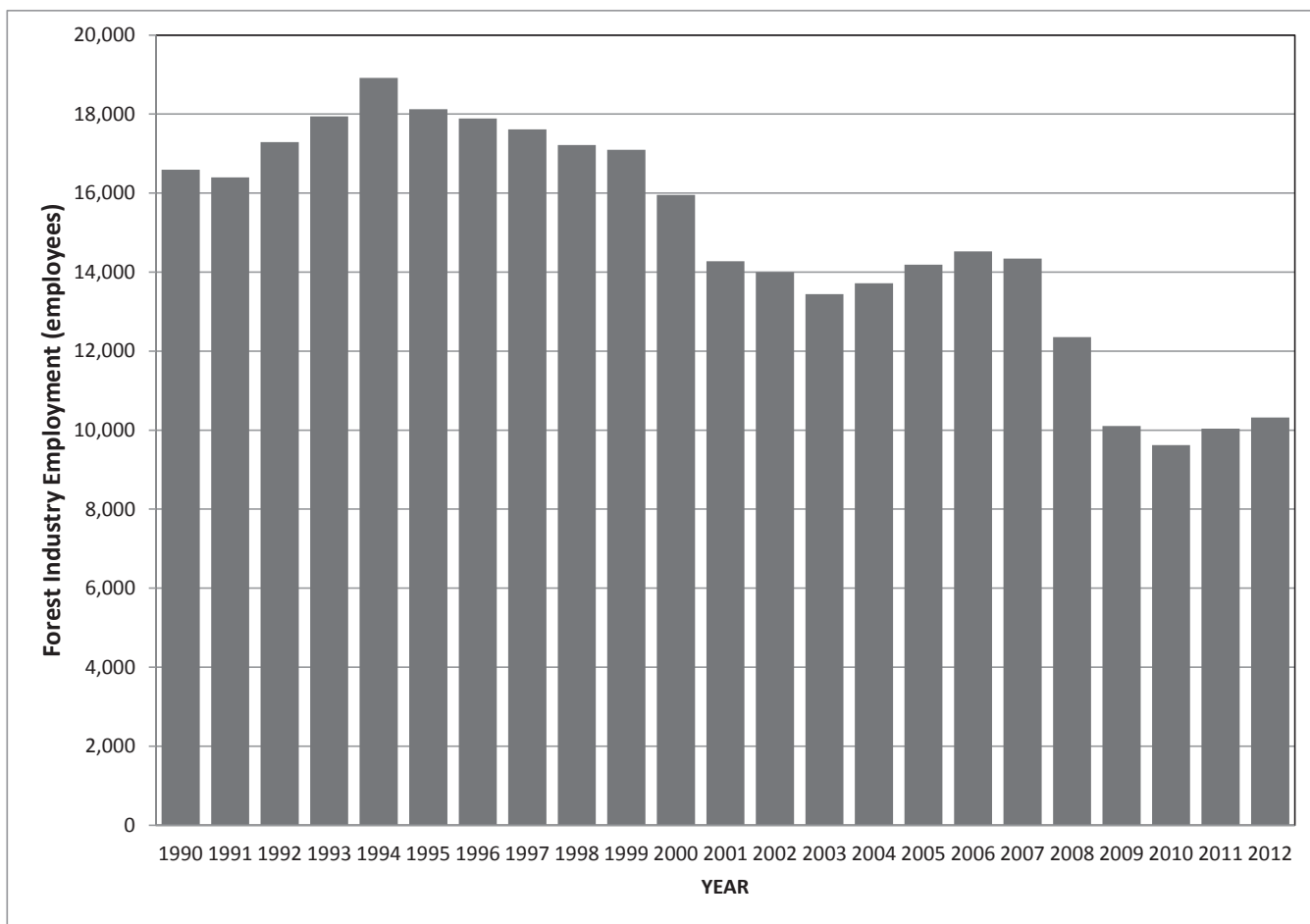


Figure 11—Idaho forest industry employment, 1990 through 2012 (source: U.S Department of Commerce, Bureau of Economic Analysis).

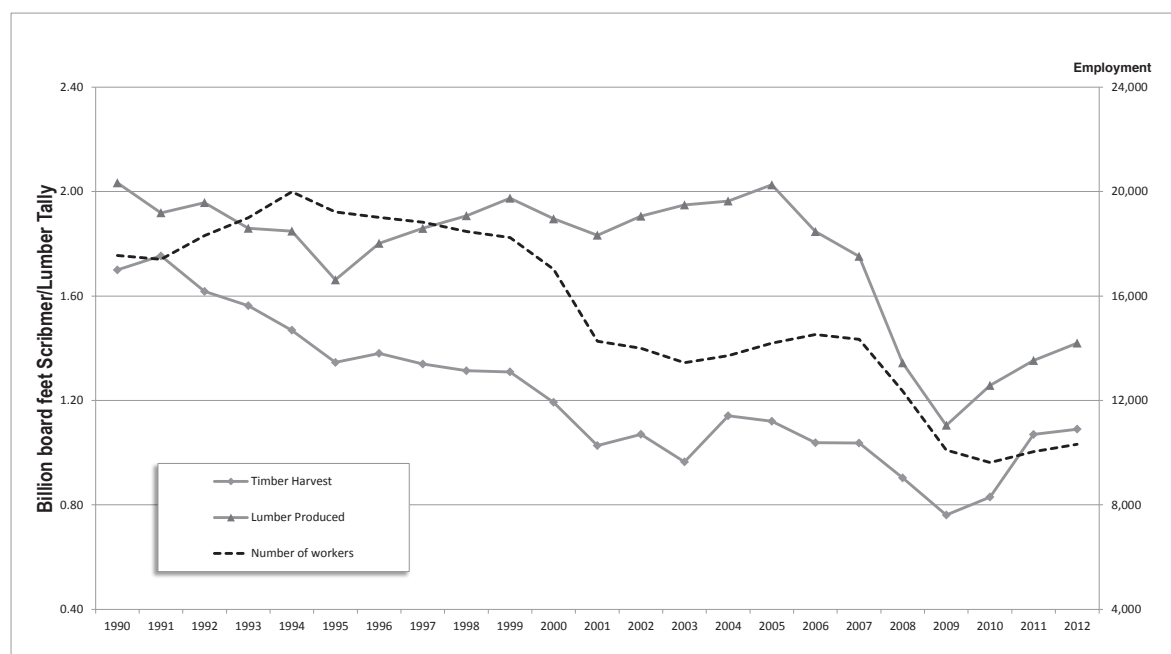


Figure 12—Idaho timber harvest, lumber production and industry employment, 1990-2012 (source: Morgan and others 2013).

Both the primary and secondary industry benefited when generally strong economic performance globally, nationally, regionally, and in Idaho yielded strong demand for wood products through much of the 1990s and in 2004 and 2005. However, the secondary industry did not suffer from the sharply constricted raw material supply that plagued the primary industry. Most of the secondary industry uses wood products manufactured by the region's primary industry, but it only consumes a fraction of what the regional primary industry produces. Additionally, the secondary industry can more easily acquire raw materials from elsewhere. It is, therefore, not as susceptible to local timber availability as is the primary industry.

The increase in employment per unit volume of timber harvested in Idaho's primary industry, which occurred in the 1990s, did not continue into the 2000s. Primary employment dropped by one-third between 2000 and the high market year of 2005, while harvest volumes in Idaho declined by 6 percent over that period. Much weaker markets led to further declines in employment from 2006 to 2008, with primary employment falling to under 9,000 in 2008. The secondary industry continued to increase employment after 2000 to approximately 6,000 workers in 2006 and 2007. With much poorer economic conditions in 2008, secondary employment declined to an estimated 5,400 workers.

Workers earnings is the compensation that is a return-to-work effort, including labor earnings, employer-provided benefits, taxes paid to the government on behalf of employees, and the portion of entrepreneurial income which is a return to labor (US DOC BEA 2013). All earnings values for this section have been adjusted to 2011 constant dollars. Similar to employment, workers earnings increased in the 1990s from \$917 million to \$1.0 billion in 1999 and with the accelerated loss of primary forest industry workers, workers earnings have declined steadily since 1999, dropping dramatically in 2008 and 2009 in response to the Great Recession and U.S. housing collapse (figure 13). Total workers earnings bottomed out in 2009 at \$485 million and recovered to over \$537 million in 2012, but still lag the pre-recession level of \$744 million in 2006. The annual earnings per worker in the industry has been fairly stable over the last 25 years, averaging \$54,028 with the lowest year in 1991 at \$47,011 and the highest year in 1999 at \$59,873. At \$53,090, 2011 individual earnings were 98 percent of the 25-year average.

The forest products industry is substantially more important in the ten Idaho counties north of the Salmon River (Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Lewis, Nez Perce, and Shoshone counties) than in the state as a whole. Measured by labor income, less than 20 percent of the state's economic activity is in northern Idaho; however, \$420 million out of \$743 million in forest industry labor income (57 percent) is in these northern Idaho counties. Furthermore, virtually all of the wood and paper industry in northern Idaho is part of the primary forest products industry and directly engaged in managing forests, harvesting timber, and processing timber products. Northern Idaho accounted for nearly 90 percent of the harvest, received 95 percent of the harvest for processing, and accounted for almost 97 percent of the lumber production in 2011. For each of the 953 MMBF harvested in northern Idaho the industry provided 18 jobs (10 forest product industry + 8 in support), \$629 thousand in labor income, and \$2.9 million in sales of goods and services (Morgan and others 2013).

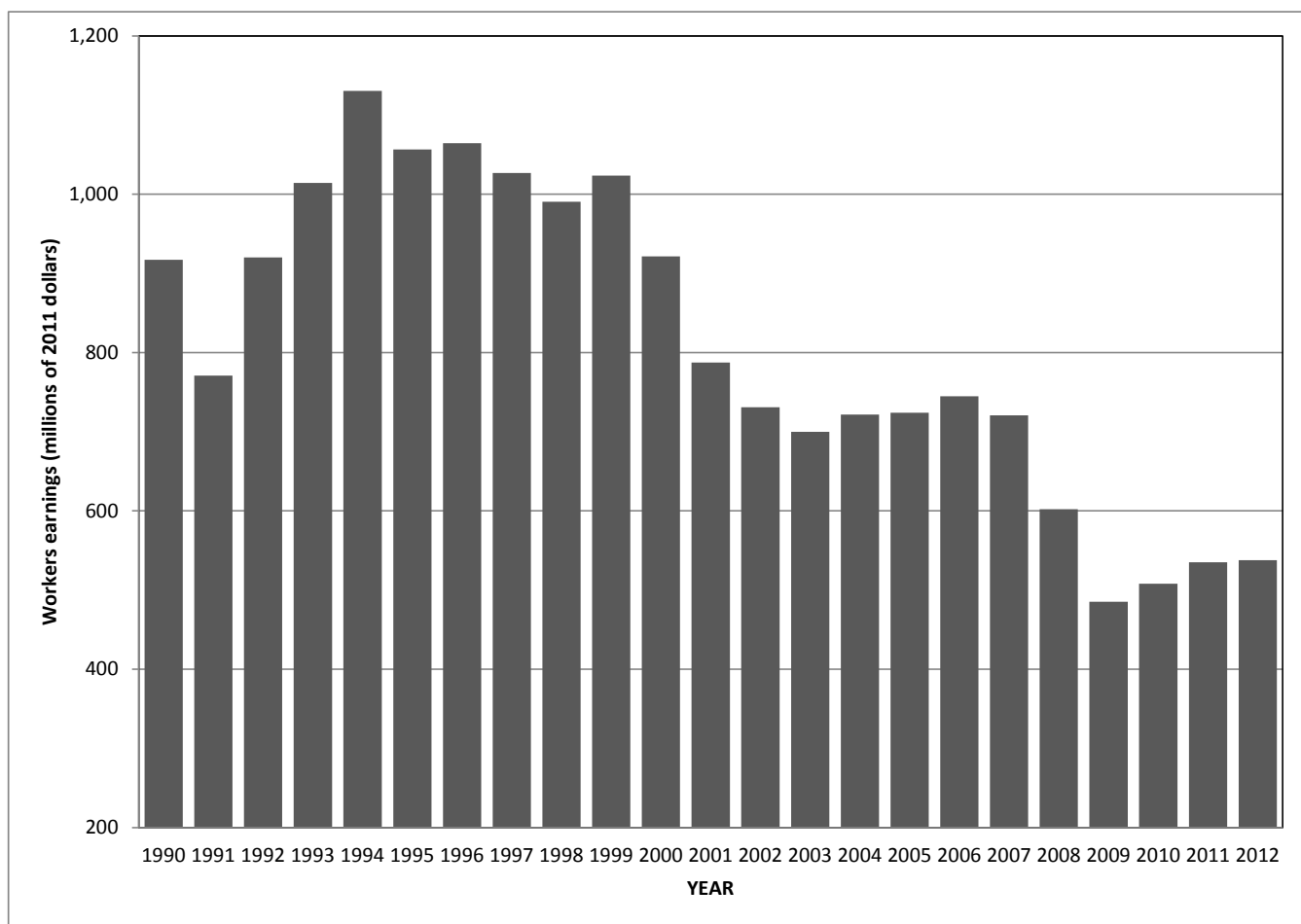


Figure 13—Idaho's forest industry adjusted labor income, 1990 through 2012 (source: U.S Department of Commerce, Bureau of Economic Analysis).

Idaho's Forest Industry Outlook 2014

Wood products markets in 2014 and 2015 are generally expected to improve, as new home construction is expected to approach 1.1 million units in 2014 and 1.4 million in 2015. Coupled with considerable unutilized capacity to produce lumber in North America and strong but erratic export markets, wood products prices are expected to increase but remain volatile. Continued economic recovery, increased housing starts, and rising product prices should benefit Idaho's forest industry, further stimulating production, sales, and employment for the state's mills and loggers. Many Idaho mills still have unutilized processing capacity, and could be positioned to increase output as markets and other factors improve.

Factors constraining industry growth potential include the overall economy, the housing market, a viable logging and hauling work force, and timber availability. There is a strong sentiment in the industry that logging capacity is at critical levels and the logging and hauling contract force is in danger of collapse altogether (Keough 2014). Additionally, with almost three-fourths of the timberlands in the state under Federal ownership, availability of timber is a challenge to Idaho's forest

industry. Without a reliable and affordable supply of timber, mills have difficulty responding to increasing demand for wood products. Finding solutions to raw material availability and the log supply issue for primary wood products processors in the next few years is key for the continued success of the forest industry in Idaho.

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