Forest2Market®

The Economic Impact of Privately-Owned Forests

Prepared for:
National Alliance
of Forest Owners

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1.0 Executive Summary

Privately-owned forests are an important part of the U.S. economy. As working forests, they employ active management techniques (land management planning, fertilizing, planting, thinning and harvesting) to produce timber, logs, pulpwood, chips and wood fuel. These intermediate outputs are then used by manufacturers of wood products, paper products and furniture and by energy producers to create higher value products. Private, working forests also contribute to the economy through recreation and tourism spending, hunting leases, and real estate taxes. In scope, these industries contribute as much to the national economy as the plastics and rubber manufacturing industry.

This study quantifies, in multiple ways, the contribution of the forestry, wood products, paper products and wood furniture industries on state and regional economies (exceptions are noted).

Table 1.1 shows the 5 regions and the 29 states that are covered in this study. In addition, it contains a breakdown of the following:

- The number of jobs created for each 1,000 acres of privately-owned forests (an average of 8 jobs).
- The amount of payroll that is generated for each acre of privately-owned forest (an average of $270)
- The state taxes (both income and severance) generated for each acre of privately-owned forest (an average of $9.85)
- The annual sales generated by each acre of privately-owned forest ($733)
- Contribution made to state and regional GDPs by each acre of privately-owned forests (an average of $318)

Contribution to state GDP per acre data show most dramatically the additional value that privately-owned forests make to the economy. For the 29 states covered in this study, the contribution to GDP per acre for all forests is $359; private forests account for $318 of this total and other ownership types account for an average of $41 per acre.

The difference between private and public GDP contribution demonstrates the extent of the additional value added by privately-owned forests that are, in large part, actively managed. In aggregate, privately-owned forests in these states created $277 per acre more than forests with other ownership types.

Table 1.1: Economic Impact of Privately-Owned Forests, 2006

	DII Employment per 1000 Acres (1)	DII Payroll Contribution per Acre (1)	State Tax Contribution per Acre (2)	Annual Sales per Acre (3)	Contribution to GDP per Acre
TOTAL	**8.0**	$ 270	**$ 9.85**	**$ 733**	**$ 318**
Northeast	**3.9**	**$ 135**	**$ 7.48**	**$ 371**	**$ 159**
Maine	3.1	$ 94	$ 4.75	$ 289	$ 136
New Hampshire	4.4	$ 155	$ 6.86	$ 309	$ 140
New York	4.7	$ 184	$ 10.98	$ 513	$ 205
Vermont	3.8	$ 108	$ 6.13	$ 243	$ 105
Appalachia	**9.5**	**$ 335**	**$ 11.34**	**$ 931**	**$ 324**
Kentucky	6.3	$ 206	$ 7.61	$ 635	$ 239
Maryland	15.6	$ 560	$ 14.63	$ 1,644	$ 478
Ohio	17.8	$ 622	$ 26.10	$ 1,609	$ 551
Pennsylvania	13.0	$ 482	$ 12.58	$ 1,349	$ 469
West Virginia	2.4	$ 72	$ 3.12	$ 192	$ 72
South	**7.6**	**$ 248**	**$ 9.29**	**$ 683**	**$ 277**
Alabama	6.6	$ 214	$ 7.32	$ 633	$ 246
Arkansas	5.5	$ 175	$ 6.14	$ 505	$ 182
Florida	7.7	$ 241	$ -	$ 703	$ 405
Georgia	7.3	$ 253	$ 14.93	$ 691	$ 262
Louisiana	5.0	$ 167	$ 7.09	$ 581	$ 199
Mississippi	4.1	$ 117	$ 4.43	$ 352	$ 131
North Carolina	12.0	$ 390	$ 24.59	$ 887	$ 316
Oklahoma	4.8	$ 151	$ 4.84	$ 575	$ 223
South Carolina	7.5	$ 242	$ 10.81	$ 745	$ 308
Tennessee	8.1	$ 270	$ 14.87	$ 648	$ 323
Texas	14.9	$ 501	$ -	$ 1,251	$ 564
Virginia	8.6	$ 276	$ 9.34	$ 770	$ 277
Upper Midwest	**9.3**	**$ 324**	**$ 15.49**	**$ 809**	**$ 318**
Michigan	6.0	$ 198	$ 6.50	$ 544	$ 205
Minnesota	7.2	$ 277	$ 15.66	$ 627	$ 272
Wisconsin	14.2	$ 489	$ 26.02	$ 1,210	$ 468
Northwest	**10.9**	**$ 375**	**$ 8.45**	**$ 998**	**$ 612**
California	14.7	$ 520	$ 16.98	$ 1,359	$ 960
Idaho	11.8	$ 345	$ 3.58	$ 943	$ 328
Montana	2.1	$ 62	$ 1.39	$ 134	$ 570
Oregon	11.1	$ 371	$ 11.93	$ 1,088	$ 382
Washington	11.4	$ 415	$ 3.73	$ 1,037	$ 509

(1) DII indicates that direct, indirect and induced employment and payrolls are included in these columns.
(2) State tax contributions include income taxes on DII payrolls and severance taxes.
(3) Annual sales per acre include the sales price of electricity generated with wood and wood waste.

2.0 The Project

Working forests make significant contributions to local, state, regional and the national economies. The National Alliance of Forest Owners (NAFO), an association of timberland owners, wishes to understand the impact that its clients have on the economy and to quantify this contribution by understanding employment, payrolls, taxes, revenue, and contribution to GDP. While studies have been done to understand the economic impacts of manufacturing at a state, regional or national level, few look at the impacts from the perspective of the timberland owner. Few are inclusive of all the impacts of forest ownership, including forestry, logging, wood products manufacturing, paper product manufacturing, wood furniture manufacturing and wood bioenergy production.

Project Goals

This study aggregates and articulates the economic impact of forests and privately-owned working forests in a number of ways:

- State, regional and national employment numbers (both direct and with direct, indirect and induced employment aggregated)
- State, regional and national payrolls (both direct and with direct, indirect and induced employment aggregated)
- Tax contributions, including state income taxes and state timber severance taxes, where applicable
- Total economic contribution, including either value of shipments (for manufactured goods) or direct sales (forestry and bioenergy),
- The impact on state gross domestic product, expressed as a percentage of state economy and as a contribution per acre

In addition, this study examines the impacts of privately-owned forests by measuring them against forest ownership of all types to estimate the added value that privately-owned forests have for state economies.

NAFO member organizations wish to quantify the contributions they make to their local economic areas. In order to facilitate this process, this study expresses economic impact as a contribution per acre whenever possible. NAFO member organizations can then multiply these numbers by the number of acres they hold to quantify the value of their organizations for their local economies.

This study covers five regions and 29 states; Table 2.1 provides a list.

Table 2.1: List of Regions and States Covered in the Study

Northeast	**South Cont.**
Maine	North Carolina
New Hampshire	Oklahoma
New York	South Carolina
Vermont	Tennessee
Appalachia	Texas
Kentucky	Virginia
Maryland	**Upper Midwest**
Ohio	Michigan
Pennsylvania	Minnesota
West Virginia	Wisconsin
South	**Northwest**
Alabama	California
Arkansas	Idaho
Florida	Montana
Georgia	Oregon
Louisiana	Washington
Mississippi	

3.0 The Methodology

3.1 Direct Employment and Payroll Figures

Direct impacts are the initial, immediate economic activities (jobs and income) generated by an industry. For this study, employment and payroll numbers are based on data collected by the U.S. Census Bureau for 2006. Statistics for 2006 were chosen because 2006 is the most recent year for which employment, payroll, sales, value of manufacturing shipments, value added, GDP and timber production figures and energy production figures are all available.

In order to protect the competitive positions of companies that have a high percentage of the market in their states, some employment numbers are not reported by the Census Bureau. In these cases, the numbers were compiled from information reported about the number of establishments in the state in each size class. For instance, though employment may not have been reported for State A, the Census Bureau reports that there were between 50-99 employees working in the industry statewide, and that there were 4 establishments doing business, 1 with 5-9 employees, one with 10-19 employees and 2 with 20-49 employees. Using an average of the size range, we estimated the number of employees at 92.

When numbers for annual payroll were not reported for the same reason, the number of employees was multiplied by the average salary for the industry, information that also comes from the U.S. Census Bureau. In the few places that information from which to estimate totals was not available, 2007 data was used.

This data is explained and accessible through the Census Bureau's 2006 County Business Patterns (NAICS) database at http://censtats.census.gov/cgi-bin/cbpnaic/cbpsel.pl

3.2 Aggregated Direct, Indirect and Induced Employment and Payroll Data

Indirect impacts are the production, employment and income changes occurring in other businesses/industries in the community that supply inputs to the industry under consideration.

Induced impacts are the effects of spending by the households in the economy as the result of direct and indirect effects. The induced effects arise when employees who are working in an industry spend their new income in the community.

The sum of the direct, indirect and induced effects is the total effect. The process of job creation and income generation continues as long as some portion of spending remains local.

In this study, the Regional Input-Output Multipliers (RIMS II) developed by the Bureau of Economic Analysis (which is part of the Department of Commerce) were used to determine the total effect of the industry; these numbers include direct, indirect and induced employment and payroll. The multiplier is an estimate of how much additional economic activity will result from a new investment in the economy. If the employment multiplier is 2.0, for instance, and if direct employment is 50, the total direct, indirect and induced employment would be 100. In effect, that means that for every one job in the industry another job is created.

RIMS II multipliers are designed to measure the effects of disruptive events on local and regional economic areas. In this study, we use the numbers to determine the effect on

employment and payrolls if any of the industries covered were to disappear. This does not preclude the potential for other industries to grow in the absence of a forestry-related industry. If, for instance, lumber were no longer being manufactured, production of steel or other substitutes would increase. This study does not take these economic impacts into consideration.

In this category, the effect of the forestry, logging and forestry support sectors have been removed because they are counted as indirect effects in the wood products, paper products and wood furniture manufacturing sectors. Removing these totals avoids any double counting.

RIMS II Multipliers are explained and can be ordered at https://www.bea.gov/regional/rims/.

3.3 Income and Severance Taxes

To calculate state income tax payments, the average tax rate for each state was multiplied by the annual direct payroll, and by annual direct, indirect and induced payroll.

To calculate severance taxes, calculations were done based on each individual state's formula for determining the amount of tax due. Some rates are based on a percentage of the value of the harvest. Other states are based on volume--a certain rate per ton, board foot, cubic foot or cord. Volumes were aggregated from information published by the Forest Inventory and Analysis Program's Timber Product Output database. Value was then determined by multiplying volumes by 2007 stumpage prices, which are based on Forest2Market's proprietary pricing databases.

The Timber Product Output database is available at http://srsfia1.fia.srs.fs.fed.us/php/tpo2/tpo2.php. State tax rates were accessed for 2006 via the Tax Foundation's website at http://www.taxfoundation.org/taxdata/show/228.html. Severance taxes are available via state websites.

3.4 Annual Sales

Annual sales figures for the forestry sector required harvest volumes, which were aggregated from information published by the Forest Inventory and Analysis Program's Timber Product Output database, and stumpage prices, which are based on Forest2Market's proprietary pricing databases. The Timber Product Output database is available at http://srsfia1.fia.srs.fs.fed.us/php/tpo2/tpo2.php.

Annual sales figures for manufacturing are based on the Value of Shipments category reported in the Annual Survey of Manufactures done by the U.S. Census Bureau for 2006, the most recent year that is available in enough detail that it provides a more precise measurement of the impact of working forests on the economy. Manufacturing data is available at http://factfinder.census.gov/servlet/IBQTable?_bm=y&-ds_name=AM0631GS101.

Annual sales figures for wood bioenergy are determined by multiplying total 2006 data about electricity generated by wood and wood waste (pellets are included in this category) by cost per kilowatt hour statistics. This information is available from the Energy Information Agency (which is a part of the Department of Energy). This information can be accessed at: http://www.eia.doe.gov/fuelelectric.html.

3.5 Gross Domestic Product

2006 GDP numbers are taken from the Bureau of Economic Analysis, which is part of the Department of Commerce. The data used in this study include 1) GDP by state, 2) forestry GDP contribution by state, 3) wood products manufacturing by state, 4) paper product manufacturing by state and 5) wood furniture by state.

3.6 Public and Private Forest Acreage

Public and private forest acreage is published by the Forestry Inventory and Analysis Program at the U.S. Forest Service. Data for 2006 is included in this study. This information can be accessed at http://fiatools.fs.fed.us/fido/index.html.

3.7 Adjustments to Manufacturing Totals

Paper manufacturing uses some portion of recycled material as a raw material. In recognition of this fact, we have adusted all paper manufacturing figures by reducing them 15 percent. (Based on an approximate recovery rate of 50 percent and an approximate export rate of 30 percent.)

Wood furniture manufacturing is extracted from total furniture manufacturing using NAICS codes for only those segments of the industry that specify wood construction.

3.8 Exclusion of Some Forestry-Related Contributions

Because complete and consistent data for recreation and tourism spending, hunting leases and real estate taxes is unavailable or cost-prohibitive to compile, the contributions made in these areas have not been quantified. They do, however, represent significant impacts on state economies.

The U.S. Fish & Wildlife Service's 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation contains data concerning hunting and other activities associated with forests. However, because this data does not contain detail about which of these activities occur on forested land, the data could not be incorporated here. NAFO members who are interested in estimating these contributions can find valuable guidance in the study. It can be accessed at http://library.fws.gov/pubs/nat_survey2006_final.pdf.

Because electricity generated from wood has been quantified, this contribution has been measured and included in the annual sales figures. No data exists for employment, payrolls, contribution to state tax coffers and GDP in the wood bioenergy industries; as a result, this information is not included in this study.

Because this study does not include contributions from these industry segments, the totals presented here are conservative in nature.

4.0 The Results

4.1 Employment

The forestry, wood products, paper products and wood furniture industries employ more than 1 million people in the 29 states examined in this study. In addition to direct employment, each job in forestry, logging and the manufacturing of wood products, paper manufacturing and wood furniture creates additional employment. Total direct, indirect and induced employment for these industries total nearly 2.9 million jobs. On average, each job in a forestry-related industry creates 1.8 jobs in other industries.

For privately-owned forests, each job creates on average an additional 2.95 jobs. Total direct employment from privately-owned forests is over 900,000 jobs in the 29 states examined in this study. Direct, indirect and induced employment totaled nearly 2.6 million.

Table 4.1.1 (page 10) contains a regional and state breakdown of employment in forestry-related industries.

These employment figures are conservative. In addition to these totals, hunting, recreation and energy provide additional direct, indirect and induced employment. Because the data that exists for these industries does not separate forest-related activities, however, it is not included in these totals.

Table 4.1.2 (page 11) contains details by region and state of the multipliers that can be used to determine the number of jobs created per 1,000 acres, both for all forests and for privately-owned forests. The difference between the two figures represents the additional contribution that can be attributed to privately-owned forests. This is the degree to which privately-owned forests contribute more jobs to the economy than forests in general.

On average, each 1,000 acres of privately-owned forest is responsible for the creation of 8 jobs.

4.2 Payrolls

Payrolls in the forestry, wood products, paper products and wood furniture industries represent a significant contribution to local and regional economies. Table 4.2.1 (page 12) contains a breakdown of payrolls by region and state.

In general, forest-related industries contribute $38 billion to the economies in the 29 states in question. In addition to direct payroll, each dollar in salary paid in forestry, logging and the manufacturing of wood products, paper manufacturing and wood furniture creates additional payroll expenses throughout the economy. Total direct, indirect and induced payroll for these industries total nearly $100 billion.

For privately-owned forests, total direct payroll from privately-owned forests represented over $34 billion in the 29 states examined in this study. Direct, indirect and induced employment totaled nearly $87 billion.

As with the employment data, these payroll figures are conservative. In addition to these totals, hunting, recreation and energy provide additional direct, indirect and induced payrolls.

Because the data that exists for these industries does not separate forest-related activities, however, it is not included in these totals.

Table 4.2.2 (page 13) contains a breakdown by region and state of the multipliers that can be used to determine the total payroll generated throughout the economy per acre of forest. Payroll contribution per acre is calculated for both all forests and for privately-owned forests. The difference between the two figures represents the additional contribution that can be attributed to privately-owned forests. This is the degree to which privately-owned forests contribute more payroll dollars to the economy than forests in general.

On average, each acre of privately-owned forest is responsible for $270.42 in payroll.

4.3 State Taxes

Taxes paid by the forestry, wood products, paper products and wood furniture industries represent a significant contribution to state governments; they include both income taxes and severance taxes paid on either harvest volume or value. In general, forest-related industries, including taxes paid on both indirect and induced payroll dollars, contribute more than $4.4 billion in taxes to the states covered in this study.

As with the employment and payroll data, these tax figures are conservative. Hunting, recreation and energy provide additional direct, indirect and induced payrolls and therefore generate tax revenue for states. Because the data that exists for these industries does not separate forest-related activities, however, it is not included in these totals.

Table 4.3.1 (page 14) also contains the multipliers that can be used to determine the total state taxes contributed by an organization. Overall, forest-related industries contribute a total of $9.85 per acre annually in state taxes alone.

4.4 Annual Sales

Annual sales across industries supported by working forests total nearly $263 billion in the 29 states included in this study, or $585 per acre. Privately-owned forests produced $235 billion of this total, or $733 per acre. The difference of $148 per acre is one way of indicating the extra value that privately-owned forests contribute to local and state economies.

In addition to forestry, logging, and the manufacturing of wood products, paper products and wood furniture, this category includes a sales price of electricity generated from wood and wood waste. This figure is applied to both electricity generated for use onsite and sales to the grid. The annual sales numbers do not include sales of hunting leases or recreational expenditures.

Table 4.4.1 (page 15) contains a breakdown of the data by state and region.

4.5 GDP Contribution

The contribution that an industry makes to gross domestic (or state) product is another way of expressing value added. By region and state, Table 4.5.1 (page 16) quantifies the contribution to GDP by working forests.

Forestry-related industries contributed more than $115 billion dollars to the economies of

the 29 states covered in the study and represented 1.2 percent of their annual economic activity in 2006. Contribution to state GDP by privately-owned forests accounted for $102 billion of this total or 1.06 percent of total GDP in the 29 states.

As Table 4.5.2 (page 17) illustrates, contribution to state GDP per acre figures show that privately-owned forests are responsible for the majority of the totals. The contribution to GDP per acre for all forests was $359; private forests accounted for $318 of this total and other ownership types accounted for an average of $41 per acre.

The difference between private and public contribution to state GDPs demonstrates the extent of the additional value added by management techniques employed by privately-owned forests. By aggregating the total for the 29 states this study covers, privately-owned forests create $277 per acre more than forests with other ownership types.

Table 4.1.1: Employment in Forestry-Related Industries, 2006
Direct and Direct, Indirect and Induced

	ALL FORESTS		PRIVATELY-OWNED FORESTS	
	Direct Employment	DII Employment	Direct Employment	DII Employment
TOTAL	**1,009,885**	**2,880,544**	**902,990**	**2,575,759**
Northeast	**66,745**	**157,638**	**62,460**	**148,838**
Maine	15,724	52,142	15,567	51,620
New Hampshire	6,589	16,648	6,128	15,483
New York	38,890	74,130	35,390	67,459
Vermont	5,541	14,718	5,374	14,276
Appalachia	**161,489**	**445,457**	**143,877**	**395,931**
Kentucky	24,244	68,936	23,759	67,557
Maryland	11,857	27,610	11,383	26,506
Ohio	50,502	145,733	42,926	123,873
Pennsylvania	64,071	178,082	55,101	153,151
West Virginia	10,815	25,096	10,707	24,845
South	**445,138**	**1,314,687**	**431,498**	**1,275,102**
Alabama	45,059	144,125	44,158	141,243
Arkansas	27,651	86,569	26,268	82,240
Florida	40,599	94,570	37,757	87,950
Georgia	52,726	167,777	51,144	162,744
Louisiana	19,222	64,042	18,838	62,761
Mississippi	25,924	73,526	25,146	71,320
North Carolina	63,221	191,343	61,957	187,516
Oklahoma	7,982	22,877	7,902	22,648
South Carolina	26,099	88,908	25,055	85,352
Tennessee	32,502	100,164	31,201	96,157
Texas	61,508	166,926	60,277	163,588
Virginia	42,647	113,860	41,794	111,583
Upper Midwest	**132,181**	**404,389**	**94,119**	**289,483**
Michigan	31,520	92,617	25,216	74,093
Minnesota	34,540	97,988	18,652	52,914
Wisconsin	66,120	213,784	50,251	162,476
Northwest	**204,332**	**558,374**	**171,036**	**466,406**
California	91,689	224,567	77,936	190,882
Idaho	13,051	41,659	9,527	30,411
Montana	6,724	18,995	5,043	14,246
Oregon	52,175	141,805	44,349	120,534
Washington	40,692	131,348	34,181	110,332

4.1.2 Direct, Indirect and Induced Employment per 1,000 Acres, 2006 All Forestland and Privately-Owned Forests

	Employment Effect per 1000 Acres--All	Employment Effect per 1000 Acres--Private	Difference[1]
TOTAL	**6.4**	**8.0**	**1.6**
Northeast	**3.7**	**3.9**	**0.2**
Maine	3.0	3.1	0.1
New Hampshire	3.6	4.4	0.8
New York	4.6	4.7	0.1
Vermont	3.3	3.8	0.5
Appalachia	**8.9**	**9.5**	**0.6**
Kentucky	5.8	6.3	0.5
Maryland	12.0	15.6	3.5
Ohio	18.9	17.8	(1.1)
Pennsylvania	11.0	13.0	1.9
West Virginia	2.1	2.4	0.3
South	**6.8**	**7.6**	**0.8**
Alabama	6.3	6.6	0.3
Arkansas	4.7	5.5	0.8
Florida	5.9	7.7	1.7
Georgia	6.9	7.3	0.4
Louisiana	4.6	5.0	0.5
Mississippi	3.8	4.1	0.4
North Carolina	10.5	12.0	1.4
Oklahoma	4.3	4.8	0.5
South Carolina	6.9	7.5	0.5
Tennessee	7.4	8.1	0.7
Texas	13.9	14.9	0.9
Virginia	7.4	8.6	1.2
Upper Midwest	**7.8**	**9.3**	**1.5**
Michigan	4.8	6.0	1.3
Minnesota	6.2	7.2	1.0
Wisconsin	13.1	14.2	1.1
Northwest	**4.9**	**10.9**	**5.9**
California	8.3	14.7	6.4
Idaho	2.3	11.8	9.5
Montana	0.9	2.1	1.2
Oregon	5.1	11.1	6.0
Washington	7.1	11.4	4.3

(1) For this study, we calculated economic contribution by total forest acres and then by privately-owned forest acres. The Difference column represents the difference between the number of jobs created by privately-owned forests and by all forests. It is one way to quantify the additional contribution made by privately-owned working forests.

Table 4.2.1: Payrolls from Forestry-Related Industries, 2006
All Ownership Types and Privately-Owned Forests
Direct and Direct, Indirect and Induced

	ALL FORESTS		PRIVATELY-OWNED FORESTS	
	Direct Payrolls	DII Payrolls	Direct Payrolls	DII Payrolls
TOTAL	**38,313,861,043**	**97,528,492,320**	**34,130,644,849**	**$ 86,878,645,065**
Northeast	**2,601,329,990**	**5,468,121,738**	**$ 2,436,391,200**	**$ 5,138,453,642**
Maine	$ 667,953,793	$ 1,568,496,499	$ 661,274,255	$ 1,552,811,534
New Hampshire	$ 248,738,850	$ 583,498,193	$ 231,327,131	$ 542,653,319
New York	$ 1,505,140,200	$ 2,894,240,772	$ 1,369,677,582	$ 2,633,759,103
Vermont	$ 179,497,147	$ 421,886,275	$ 174,112,232	$ 409,229,686
Appalachia	**5,971,266,599**	**15,723,287,579**	**$ 5,305,045,875**	**$ 13,938,786,138**
Kentucky	$ 856,532,364	$ 2,254,021,083	$ 839,401,716	$ 2,208,940,661
Maryland	$ 435,165,516	$ 993,171,578	$ 417,758,896	$ 953,444,715
Ohio	$ 1,924,028,017	$ 5,099,153,323	$ 1,635,423,814	$ 4,334,280,325
Pennsylvania	$ 2,427,106,513	$ 6,623,474,939	$ 2,087,311,601	$ 5,696,188,447
West Virginia	$ 328,434,190	$ 753,466,656	$ 325,149,848	$ 745,931,989
South	**16,467,963,430**	**42,897,646,810**	**$ 15,964,535,589**	**$ 41,612,725,582**
Alabama	$ 1,732,639,719	$ 4,652,269,501	$ 1,697,986,925	$ 4,559,224,111
Arkansas	$ 1,030,771,551	$ 2,727,881,764	$ 979,232,974	$ 2,591,487,676
Florida	$ 1,405,034,030	$ 2,970,744,368	$ 1,306,681,648	$ 2,762,792,262
Georgia	$ 2,078,350,601	$ 5,839,006,201	$ 2,016,000,083	$ 5,663,836,015
Louisiana	$ 846,423,546	$ 2,123,939,581	$ 829,495,075	$ 2,081,460,789
Mississippi	$ 877,363,503	$ 2,096,496,859	$ 851,042,598	$ 2,033,601,953
North Carolina	$ 2,237,266,596	$ 6,246,567,958	$ 2,192,521,264	$ 6,121,636,599
Oklahoma	$ 300,343,142	$ 725,705,746	$ 297,339,710	$ 718,448,688
South Carolina	$ 1,101,785,594	$ 2,892,128,221	$ 1,057,714,170	$ 2,776,443,092
Tennessee	$ 1,215,215,141	$ 3,332,704,179	$ 1,166,606,535	$ 3,199,396,011
Texas	$ 2,152,672,646	$ 5,627,732,075	$ 2,109,619,193	$ 5,515,177,433
Virginia	$ 1,490,097,360	$ 3,662,470,357	$ 1,460,295,413	$ 3,589,220,950
Upper Midwest	**5,380,598,928**	**14,176,316,160**	**$ 3,817,795,410**	**$ 10,065,438,279**
Michigan	$ 1,201,258,629	$ 3,038,949,976	$ 961,006,903	$ 2,431,159,981
Minnesota	$ 1,452,318,728	$ 3,773,272,734	$ 784,252,113	$ 2,037,567,276
Wisconsin	$ 2,727,021,571	$ 7,364,093,450	$ 2,072,536,394	$ 5,596,711,022
Northwest	**7,892,702,097**	**19,263,120,033**	**$ 6,606,876,775**	**$ 16,123,241,425**
California	$ 3,299,275,616	$ 7,958,954,927	$ 2,804,384,274	$ 6,765,111,688
Idaho	$ 493,839,811	$ 1,219,592,944	$ 360,503,062	$ 890,302,849
Montana	$ 246,086,923	$ 563,170,941	$ 184,565,192	$ 422,378,206
Oregon	$ 2,048,445,983	$ 4,747,165,605	$ 1,741,179,086	$ 4,035,090,764
Washington	$ 1,805,053,763	$ 4,774,235,617	$ 1,516,245,161	$ 4,010,357,918

Table 4.2.2: Payrolls from Forestry-Related Industries, 2006 Comparing All Ownership Types and Privately-Owned Forests Direct, Indirect and Induced

	Payroll per Acre--All	Payroll per Acre--Private	Difference[1]
TOTAL	**$ 216.92**	**$ 270.42**	**$ 53.49**
Northeast	**$ 128.56**	**$ 134.85**	**$ 6.29**
Maine	$ 90.41	$ 94.18	$ 3.78
New Hampshire	$ 126.40	$ 155.05	$ 28.65
New York	$ 180.23	$ 183.74	$ 3.51
Vermont	$ 93.53	$ 108.13	$ 14.60
Appalachia	**$ 315.59**	**$ 334.66**	**$ 19.07**
Kentucky	$ 190.17	$ 205.73	$ 15.56
Maryland	$ 432.82	$ 559.81	$ 126.99
Ohio	$ 660.84	$ 621.56	$ (39.28)
Pennsylvania	$ 409.65	$ 482.18	$ 72.53
West Virginia	$ 63.91	$ 71.56	$ 7.65
South	**$ 223.09**	**$ 248.45**	**$ 25.36**
Alabama	$ 204.88	$ 214.03	$ 9.15
Arkansas	$ 148.93	$ 174.60	$ 25.66
Florida	$ 186.70	$ 241.06	$ 54.36
Georgia	$ 239.07	$ 253.07	$ 14.00
Louisiana	$ 151.10	$ 167.47	$ 16.38
Mississippi	$ 107.08	$ 117.42	$ 10.34
North Carolina	$ 343.38	$ 390.28	$ 46.90
Oklahoma	$ 135.06	$ 151.17	$ 16.10
South Carolina	$ 224.94	$ 242.38	$ 17.44
Tennessee	$ 247.78	$ 270.47	$ 22.69
Texas	$ 468.90	$ 500.85	$ 31.95
Virginia	$ 237.59	$ 275.72	$ 38.13
Upper Midwest	**$ 274.66**	**$ 324.00**	**$ 49.34**
Michigan	$ 156.66	$ 198.07	$ 41.41
Minnesota	$ 237.29	$ 277.33	$ 40.03
Wisconsin	$ 451.38	$ 489.00	$ 37.63
Northwest	**$ 169.95**	**$ 375.22**	**$ 205.27**
California	$ 292.61	$ 520.38	$ 227.77
Idaho	$ 67.08	$ 344.57	$ 277.48
Montana	$ 26.12	$ 61.70	$ 35.59
Oregon	$ 170.49	$ 370.71	$ 200.22
Washington	$ 257.21	$ 415.32	$ 158.11

(1) For this study, we calculated economic contribution by total forest acres and then by privately-owned forest acres. The Difference column represents the difference between payroll per acre created by privately-owned forests and by all forests. It is one way to quantify the additional contribution made by privately-owned working forests.

Table 4.3.1: Total State Taxes Paid by All Ownership Types, 2006
Income Taxes, Severance Taxes, and Tax Contribution per Acre

	ALL FORESTS			
	State Income Taxes on Payrolls (DII)	Severance Taxes	Total State Taxes	Taxes per Acre
TOTALS	**$ 4,113,205,820**	**$ 313,689,327**	**$ 4,426,895,147**	**$ 9.85**
Northeast	**309,914,732**	**$ 8,070,769**	**317,985,501**	**$ 7.48**
Maine	$ 82,346,066.18	$ -	$ 82,346,066.18	$ 4.75
New Hampshire	$ 29,174,909.64	$ 2,493,088	$ 31,667,997.41	$ 6.86
New York	$ 170,760,205.55	$ 5,577,681	$ 176,337,886.52	$ 10.98
Vermont	$ 27,633,550.99	$ -	$ 27,633,550.99	$ 6.13
Appalachia	**564,225,954**	**$ 994,942**	$ 565,220,896.02	**$ 11.34**
Kentucky	$ 90,160,843	$ -	$ 90,160,843.31	$ 7.61
Maryland	$ 33,569,199	$ -	$ 33,569,199.33	$ 14.63
Ohio	$ 201,365,565	$ -	$ 201,365,564.74	$ 26.10
Pennsylvania	$ 203,340,681	$ -	$ 203,340,680.62	$ 12.58
West Virginia	$ 35,789,666	$ 994,942	$ 36,784,608.01	$ 3.12
South	**1,595,747,006**	**$ 190,076,595**	**$ 1,785,823,601.64**	**$ 9.29**
Alabama	$ 162,829,433	$ 3,338,934	$ 166,168,366.48	$ 7.32
Arkansas	$ 109,115,271	$ 3,387,227	$ 112,502,497.43	$ 6.14
Florida	$ -	$ -	$ -	$ -
Georgia	$ 204,365,217	$ 160,269,197	$ 364,634,414.27	$ 14.93
Louisiana	$ 84,957,583	$ 14,705,006	$ 99,662,589.49	$ 7.09
Mississippi	$ 83,859,874	$ 2,865,168	$ 86,725,042.09	$ 4.43
North Carolina	$ 445,380,295	$ 1,860,732	$ 447,241,027.15	$ 24.59
Oklahoma	$ 25,980,266	$ -	$ 25,980,265.70	$ 4.84
South Carolina	$ 137,376,091	$ 1,621,542	$ 138,997,632.15	$ 10.81
Tennessee	$ 199,962,251	$ -	$ 199,962,250.71	$ 14.87
Texas	$ -	$ -	$ -	$ -
Virginia	$ 141,920,726	$ 2,028,790	$ 143,949,516.16	$ 9.34
Upper Midwest	**785,467,353**	**$ 14,080,050**	**$ 799,547,402.58**	**$ 15.49**
Michigan	$ 118,519,049	$ 7,493,458	$ 126,012,507.13	$ 6.50
Minnesota	$ 249,036,000	$ -	$ 249,036,000.45	$ 15.66
Wisconsin	$ 417,912,303	$ 6,586,592	$ 424,498,895.00	$ 26.02
Northwest	**857,850,774**	**$ 100,466,971**	**$ 958,317,745.18**	**$ 8.45**
California	$ 445,701,476	$ 16,226,737	$ 461,928,212.85	$ 16.98
Idaho	$ 57,320,868	$ 7,686,312	$ 65,007,180.14	$ 3.58
Montana	$ 22,526,838	$ 7,348,228	$ 29,875,065.55	$ 1.39
Oregon	$ 332,301,592	$ -	$ 332,301,592.35	$ 11.93
Washington	$ -	$ 69,205,694	$ 69,205,694.29	$ 3.73

Table 4.4.1: Annual Sales by Forestry-Related Industries, 2006
Contribution per Acre, All Forests and Privately-Owned Forests

	ALL FORESTS		PRIVATELY-OWNED FORESTS		
	Annual Sales Forest-Related Industries	Sales per Acre	Annual Sales Forest-Related Industries	Sales per Acre	Difference[1]
Total	**262,955,820,759**	**$ 585**	**235,369,606,557**	**$ 733**	**$ 148**
Northeast	**15,010,588,703**	**$ 353**	**$ 14,124,878,875**	**$ 371**	**$ 18**
Maine	$ 4,812,583,708	$ 277	$ 4,764,457,870	$ 289	$ 12
New Hampshire	$ 1,164,716,082	$ 252	$ 1,083,185,956	$ 309	$ 57
New York	$ 8,084,253,295	$ 503	$ 7,356,670,499	$ 513	$ 10
Vermont	$ 949,035,619	$ 210	$ 920,564,550	$ 243	$ 33
Appalachia	**43,626,992,437**	**$ 876**	**$ 38,776,209,013**	**$ 931**	**$ 55**
Kentucky	$ 6,955,420,189	$ 587	$ 6,816,311,785	$ 635	$ 48
Maryland	$ 2,917,082,719	$ 1,271	$ 2,800,399,410	$ 1,644	$ 373
Ohio	$ 13,200,420,685	$ 1,711	$ 11,220,357,583	$ 1,609	$ (102)
Pennsylvania	$ 18,533,753,233	$ 1,146	$ 15,939,027,781	$ 1,349	$ 203
West Virginia	$ 2,020,315,611	$ 171	$ 2,000,112,455	$ 192	$ 21
South	**118,034,666,914**	**$ 614**	**$ 114,471,796,997**	**$ 683**	**$ 70**
Alabama	$ 13,763,871,256	$ 606	$ 13,488,593,831	$ 633	$ 27
Arkansas	$ 7,897,385,778	$ 431	$ 7,502,516,489	$ 505	$ 74
Florida	$ 8,663,437,711	$ 544	$ 8,056,997,072	$ 703	$ 159
Georgia	$ 15,937,600,662	$ 653	$ 15,459,472,642	$ 691	$ 38
Louisiana	$ 7,373,211,139	$ 525	$ 7,225,746,916	$ 581	$ 57
Mississippi	$ 6,277,489,091	$ 321	$ 6,089,164,418	$ 352	$ 31
North Carolina	$ 14,201,853,834	$ 781	$ 13,917,816,757	$ 887	$ 107
Oklahoma	$ 2,758,886,681	$ 513	$ 2,731,297,815	$ 575	$ 61
South Carolina	$ 8,890,395,738	$ 691	$ 8,534,779,908	$ 745	$ 54
Tennessee	$ 7,985,658,719	$ 594	$ 7,666,232,370	$ 648	$ 54
Texas	$ 14,053,358,936	$ 1,171	$ 13,772,291,757	$ 1,251	$ 80
Virginia	$ 10,231,517,369	$ 664	$ 10,026,887,022	$ 770	$ 107
Upper Midwest	**35,088,695,484**	**$ 680**	**$ 25,123,475,298**	**$ 809**	**$ 129**
Michigan	$ 8,339,489,780	$ 430	$ 6,671,591,824	$ 544	$ 114
Minnesota	$ 8,534,149,368	$ 537	$ 4,608,440,659	$ 627	$ 91
Wisconsin	$ 18,215,056,336	$ 1,116	$ 13,843,442,815	$ 1,210	$ 93
Northwest	**51,194,877,221**	**$ 452**	**$ 42,873,246,374**	**$ 998**	**$ 546**
California	$ 20,779,041,192	$ 764	$ 17,662,185,014	$ 1,359	$ 595
Idaho	$ 3,337,790,413	$ 184	$ 2,436,587,001	$ 943	$ 759
Montana	$ 1,226,413,631	$ 57	$ 919,810,223	$ 134	$ 77
Oregon	$ 13,929,326,821	$ 500	$ 11,839,927,798	$ 1,088	$ 587
Washington	$ 11,922,305,165	$ 642	$ 10,014,736,338	$ 1,037	$ 395

(1) For this study, we calculated economic contribution by total forest acres and then by privately-owned forest acres. The Difference column represents the difference between the annual sales per acre by privately-owned forests and by all forests. It is one way to quantify the additional contribution made by privately-owned working forests.

Table 4.5.1: Contribution to GDP by State, Percentage of State GDP, 2006
All Forests and Privately-Owned Forests

	ALL FORESTS		PRIVATELY-OWNED FORESTS	
	Contribution to GDP-- All Forests	Percentage of State GDP	Contribution to GDP-- Private	Percentage of State GDP
TOTALS	**$ 115,191,955,000**	**1.20%**	**$ 102,126,114,970**	**1.06%**
Northeast	**$ 6,434,118,000**	**0.55%**	**$ 6,071,694,440**	**0.52%**
Maine	$ 2,270,550,000	4.90%	$ 2,247,844,500	4.85%
New Hampshire	$ 526,807,000	0.94%	$ 489,930,510	0.87%
New York	$ 3,228,979,000	0.31%	$ 2,938,370,890	0.28%
Vermont	$ 407,782,000	1.65%	$ 395,548,540	1.60%
Appalachia	**$ 15,188,101,000**	**1.07%**	**$ 13,514,477,130**	**0.96%**
Kentucky	$ 2,620,482,000	1.79%	$ 2,568,072,360	1.75%
Maryland	$ 848,107,000	0.34%	$ 814,182,720	0.32%
Ohio	$ 4,521,293,000	1.01%	$ 3,843,099,050	0.86%
Pennsylvania	$ 6,439,337,000	1.27%	$ 5,537,829,820	1.09%
West Virginia	$ 758,882,000	1.36%	$ 751,293,180	1.35%
South	**$ 47,882,964,000**	**1.21%**	**$ 46,364,166,570**	**1.17%**
Alabama	$ 5,349,325,000	3.37%	$ 5,242,338,500	3.30%
Arkansas	$ 2,841,094,000	3.13%	$ 2,699,039,300	2.98%
Florida	$ 4,994,613,000	0.69%	$ 4,644,990,090	0.64%
Georgia	$ 6,043,055,000	1.61%	$ 5,861,763,350	1.56%
Louisiana	$ 2,522,925,000	1.28%	$ 2,472,466,500	1.25%
Mississippi	$ 2,340,637,000	2.79%	$ 2,270,417,890	2.71%
North Carolina	$ 5,059,996,000	1.34%	$ 4,958,796,080	1.31%
Oklahoma	$ 1,068,876,000	0.82%	$ 1,058,187,240	0.82%
South Carolina	$ 3,671,588,000	2.51%	$ 3,524,724,480	2.41%
Tennessee	$ 3,979,738,000	1.69%	$ 3,820,548,480	1.62%
Texas	$ 6,334,962,000	0.59%	$ 6,208,262,760	0.58%
Virginia	$ 3,676,155,000	1.00%	$ 3,602,631,900	0.98%
Upper Midwest	**$ 13,897,192,000**	**1.65%**	**$ 9,872,583,760**	**1.17%**
Michigan	$ 3,148,922,000	0.84%	$ 2,519,137,600	0.67%
Minnesota	$ 3,705,632,000	1.54%	$ 2,001,041,280	0.83%
Wisconsin	$ 7,042,638,000	3.13%	$ 5,352,404,880	2.38%
Northwest	**$ 31,789,580,000**	**1.41%**	**$ 26,303,193,070**	**1.17%**
California	$ 14,684,185,000	0.85%	$ 12,481,557,250	0.72%
Idaho	$ 1,159,335,000	2.39%	$ 846,314,550	1.74%
Montana	$ 5,202,657,000	16.36%	$ 3,901,992,750	12.27%
Oregon	$ 4,887,000,000	3.23%	$ 4,153,950,000	2.75%
Washington	$ 5,856,403,000	2.03%	$ 4,919,378,520	1.70%

Table 4.5.2: Contribution to GDP per Acre, by State, 2006

	Contribution to GDP per Acre			
	ALL FORESTS	PRIVATELY-OWNED FORESTS	PUBLICLY-OWNED FORESTS	DIFFERENCE[1]
TOTALS	**$ 359**	**$ 318**	**$ 41**	**$ 277**
Northeast	**$ 169**	**$ 159**	**$ 10**	**$ 150**
Maine	$ 138	$ 136	$ 1	$ 135
New Hampshire	$ 151	$ 140	$ 11	$ 129
New York	$ 225	$ 205	$ 20	$ 185
Vermont	$ 108	$ 105	$ 3	$ 101
Appalachia	**$ 365**	**$ 324**	**$ 40**	**$ 284**
Kentucky	$ 244	$ 239	$ 5	$ 234
Maryland	$ 498	$ 478	$ 20	$ 458
Ohio	$ 648	$ 551	$ 97	$ 454
Pennsylvania	$ 545	$ 469	$ 76	$ 392
West Virginia	$ 73	$ 72	$ 1	$ 71
South	**$ 286**	**$ 277**	**$ 9**	**$ 268**
Alabama	$ 251	$ 246	$ 5	$ 241
Arkansas	$ 191	$ 182	$ 10	$ 172
Florida	$ 436	$ 405	$ 31	$ 375
Georgia	$ 270	$ 262	$ 8	$ 254
Louisiana	$ 203	$ 199	$ 4	$ 195
Mississippi	$ 135	$ 131	$ 4	$ 127
North Carolina	$ 323	$ 316	$ 6	$ 310
Oklahoma	$ 225	$ 223	$ 2	$ 220
South Carolina	$ 321	$ 308	$ 13	$ 295
Tennessee	$ 336	$ 323	$ 13	$ 310
Texas	$ 575	$ 564	$ 12	$ 552
Virginia	$ 282	$ 277	$ 6	$ 271
Upper Midwest	**$ 447**	**$ 318**	**$ 130**	**$ 188**
Michigan	$ 257	$ 205	$ 51	$ 154
Minnesota	$ 504	$ 272	$ 232	$ 40
Wisconsin	$ 615	$ 468	$ 148	$ 320
Northwest	**$ 740**	**$ 612**	**$ 128**	**$ 484**
California	$ 1,130	$ 960	$ 169	$ 791
Idaho	$ 449	$ 328	$ 121	$ 206
Montana	$ 760	$ 570	$ 190	$ 380
Oregon	$ 449	$ 382	$ 67	$ 314
Washington	$ 607	$ 509	$ 97	$ 412

(1) For this study, we calculated economic contribution by total forest acres and then by privately-owned forest acres. The Difference column represents the difference between contribution to GDP per acre by privately-owned forests and by all forests. It is one way to quantify the additional contribution made by privately-owned working forests.

5.0 Conclusions

Working forests contribute significantly to local and state economies. On an acre-for-acre basis, the data show that privately-owned forests are responsible for the majority of the positive economic effects that forestry-related industries produce.

Working forests are significant economic drivers of local, rural economies. In areas that are traditionally challenged by a need for sources of employment, payrolls and taxes, privately-owned and productive forests represent a source of stability. Table 5.1 (page 19) shows the economic impact that working forests (and the forestry-related industries they support) have on local economies on a state-by-state basis.

The wood bioenergy industry is growing quickly in many parts of the study area. If past trends hold true, the demands of this burgeoning industry will fall on working forests. As this happens, the contributions that private forests have on local economies will increase.

Overall, forestry-related industries contribute as much to the economy as the plastics and rubber industry.

Table 5.1: Economic Impact of Privately-Owned Forests, 2006

	DII Employment per 1000 Acres (1)	DII Payroll Contribution per Acre (1)	State Tax Contribution per Acre (2)	Annual Sales per Acre (3)	Contribution to GDP per Acre
TOTAL	**8.0**	$ 270	**$ 9.85**	**$ 733**	**$ 318**
Northeast	**3.9**	**$ 135**	**$ 7.48**	**$ 371**	**$ 159**
Maine	3.1	$ 94	$ 4.75	$ 289	$ 136
New Hampshire	4.4	$ 155	$ 6.86	$ 309	$ 140
New York	4.7	$ 184	$ 10.98	$ 513	$ 205
Vermont	3.8	$ 108	$ 6.13	$ 243	$ 105
Appalachia	**9.5**	**$ 335**	**$ 11.34**	**$ 931**	**$ 324**
Kentucky	6.3	$ 206	$ 7.61	$ 635	$ 239
Maryland	15.6	$ 560	$ 14.63	$ 1,644	$ 478
Ohio	17.8	$ 622	$ 26.10	$ 1,609	$ 551
Pennsylvania	13.0	$ 482	$ 12.58	$ 1,349	$ 469
West Virginia	2.4	$ 72	$ 3.12	$ 192	$ 72
South	**7.6**	**$ 248**	**$ 9.29**	**$ 683**	**$ 277**
Alabama	6.6	$ 214	$ 7.32	$ 633	$ 246
Arkansas	5.5	$ 175	$ 6.14	$ 505	$ 182
Florida	7.7	$ 241	$ -	$ 703	$ 405
Georgia	7.3	$ 253	$ 14.93	$ 691	$ 262
Louisiana	5.0	$ 167	$ 7.09	$ 581	$ 199
Mississippi	4.1	$ 117	$ 4.43	$ 352	$ 131
North Carolina	12.0	$ 390	$ 24.59	$ 887	$ 316
Oklahoma	4.8	$ 151	$ 4.84	$ 575	$ 223
South Carolina	7.5	$ 242	$ 10.81	$ 745	$ 308
Tennessee	8.1	$ 270	$ 14.87	$ 648	$ 323
Texas	14.9	$ 501	$ -	$ 1,251	$ 564
Virginia	8.6	$ 276	$ 9.34	$ 770	$ 277
Upper Midwest	**9.3**	**$ 324**	**$ 15.49**	**$ 809**	**$ 318**
Michigan	6.0	$ 198	$ 6.50	$ 544	$ 205
Minnesota	7.2	$ 277	$ 15.66	$ 627	$ 272
Wisconsin	14.2	$ 489	$ 26.02	$ 1,210	$ 468
Northwest	**10.9**	**$ 375**	**$ 8.45**	**$ 998**	**$ 612**
California	14.7	$ 520	$ 16.98	$ 1,359	$ 960
Idaho	11.8	$ 345	$ 3.58	$ 943	$ 328
Montana	2.1	$ 62	$ 1.39	$ 134	$ 570
Oregon	11.1	$ 371	$ 11.93	$ 1,088	$ 382
Washington	11.4	$ 415	$ 3.73	$ 1,037	$ 509

(1) DII indicates that direct, indirect and induced employment and payrolls are included in these columns.
(2) State tax contributions include income taxes on DII payrolls and severance taxes.
(3) Annual sales per acre include the sales price of electricity generated with wood and wood waste.