

The Economic Importance of Maine's Forests

North East State Foresters Association
DECEMBER 2004*

Maine is the most forested state in the nation. Approximately 17.8 million acres, or nearly 90% of the state's total land area is covered with trees. The forest helps define the Maine "Way of Life." It plays a huge role in shaping our state's economy and provides the backdrop for forest-related recreation and tourism. However, the forest provides more than just wood products and recreational opportunities. It provides habitat for wildlife, quiet areas for spiritual renewal, a source of clean water, biological diversity beyond our own understanding, and a source of pride for many landowners.

I hope this report adds to your understanding of the wonderful resources of the Maine forest.

ALEC GIFFEN, Director
Maine Forest Service

This booklet is part of a series on the importance of forest-based manufacturing and forest-related recreation and tourism to the economy of the four states in the NEFA region, which include New York, Vermont, New Hampshire, and Maine. A regional report, and the individual state reports, are also available online at nefainfo.org. The reports include an overview of the land base in each state and a summary of federal and state data from 2001-2003 that provide a picture of the forest-based manufacturing and forest-related recreation and tourism sectors of the economy. The reports do not include indirect or induced multipliers, so all data provided represent direct contributions to the economy.

The reports update a similar series produced by NEFA in 1995 and 2001. Different data sources and methods to calculate values were used at that time, so values from the current reports cannot be compared to the previous ones. The economic benefits associated with forest values such as clean water, soil stabilization, and regional green space are not included in this report, so the final values are conservative.

** Published December 2004, using 2001-2003 data.*

HIGHLIGHTS

- Maine is the major timber producer of the NEFA region, accounting for roughly half of wood production.
- The annual contribution of forest-based manufacturing and forest-related recreation and tourism to the Maine economy is over **\$6.2 billion**.
- Forest-based manufacturing is the largest manufacturing industry in Maine, contributing **\$5.2 billion in value of shipments** to the economy in 2001, or 36% of Maine's total manufacturing sales.
- The forest-based manufacturing industry provides employment for 21,692 people and generates a payroll of over **\$1.0 billion**, the largest payroll in Maine's manufacturing sector. Forest-based recreation and tourism provides employment for over 12,000 and generates payrolls of **\$145 million**.
- In 2002, forest-based manufacturing contributed **\$1.6 billion** in Gross State Product (GSP) to the state economy, or 34% of the manufacturing GSP for Maine.
- Revenues from forest-related recreation and tourism activities totaled **\$1.02 billion** in 2001.
- Maine landowners received estimated stumpage revenue in 2002 of **\$225 million**.
- The sale of Christmas trees, wreaths, and maple syrup contributed **\$13 million** in 2001.
- Wood provides the energy for approximately 24% of electrical use in Maine. Revenues from the sales of biomass chips in 2002 totaled **\$13 million**. The most current data indicates that in 1998, 470,000 cords of firewood were harvested and processed in Maine, contributing **\$44 million** to the economy.
- Each 1,000 acres of forest land in Maine supports 1.2 forest-based manufacturing jobs and .6 forest-related tourism and recreation jobs.

Table 1. ANNUAL REVENUES FROM MAINE'S FORESTS

Total values and per acre basis

	<i>Millions of \$</i>	<i>\$ per acre</i>
Forest-based manufacturing value of shipments	5,264	307
Forest-related recreation and tourism	1,020	60
Christmas trees/maple products	13	.76
Totals	6,297	368

The Forest Resource in Maine

Maine covers 19.8 million acres. Ninety percent, or 17.7 million acres, is forested. The USDA Forest Service classifies 17.3 million acres as timberland, or land that is fertile and accessible enough to produce wood as a crop and is not withdrawn from timber harvesting by statute or regulation (table 2).

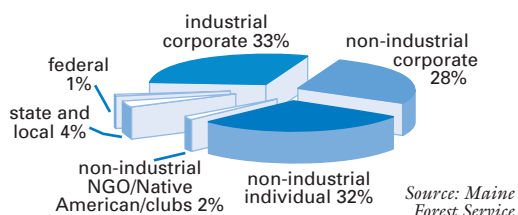
Table 2. TOTAL LAND AREA, FOREST LAND ACRES, AND TIMBERLAND ACRES, MAINE, 2002

<i>Total land area</i>	<i>Forest land</i>	<i>Timberland</i>
19,951,394	17,717,500	17,338,955

The majority of timberland in Maine is privately owned (16.5 million acres or 95%). The Maine Forest Service estimates that 33% is owned by the forest industry, investor groups own 28% (non-industrial corporate), and 34% is owned by small non-industrial

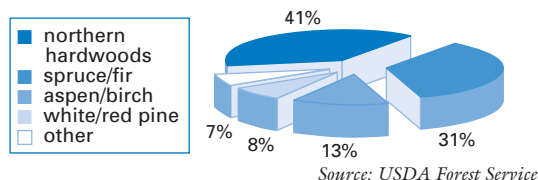
owners, NGO's, Native Americans, and associations/clubs. State and federal government own 798,077 acres or 5% of timberland (figure 1).

Figure 1. TIMBERLAND OWNERSHIP, MAINE, 2002



Certain tree species in the forest grow in association with one another due to similar growing requirements and are referred to as forest types. The northern hardwood forest type is the most common in Maine (figure 2) and covers 7.1 million acres (41%), followed by the spruce/fir, aspen/birch, and white/red pine.

Figure 2. FOREST TYPES, MAINE, 2003



Maine's Forest Industry

Maine has the largest and most diverse forest products industry in New England. The industry faces unprecedented challenges in today's global economy, but is taking tangible steps to address these challenges. Many sectors of the Maine forest industry are producing as much or more product than recent historic averages, and the output of some sectors of the industry have grown significantly in the last few decades. As an industry, forest products manufacturers have continued to invest, innovate, and produce.

While Maine's forest industry is in the midst of what will be continued and rapid evolution, the industry remains a pillar of Maine's rural economy, and is taking steps to retain or improve its competitive position. For example, output at paper mills and sawmills is near record levels when measured by volume, though employment is

down. In order to remain competitive in the future, it is likely that existing manufacturers will need to increase productivity, which will likely lead to fewer, more highly-skilled employees in the forest products industry.¹

Forest-based Manufacturing

The forest-based manufacturing system consists of timber harvesting, primary manufacturing, and secondary manufacturing. The chain of relationships among different parts of the system varies. Timber harvesters cut the trees down and market the logs, which are processed at sawmills in Maine, or exported for further processing. Primary manufacturers convert raw material into lumber, veneer, pulp, and paper. Some of the lumber is shipped out-of-state for further processing. Secondary wood-based manufacturing firms convert the raw material into finished products, but may purchase lumber from a broker who supplies wood from outside Maine.

This report includes several economic indicators on forest-based manufacturing that are provided by the federal government. Employment and payroll data are taken from the US Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, 2003. Value-added contributions and the value of shipments are provided by the US Bureau of Census, Annual Survey of Manufacturers, 2001 (except for logging, which is taken from the US Bureau of Census, 1997 Economic Census, the most recent data available).

Primary Manufacturing

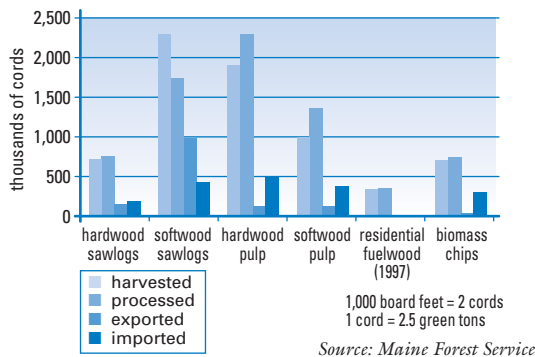
The conversion of roundwood, or parts of trees, into lumber, veneer, pulp, and paper starts with the primary manufacturing sectors. In Maine a large paper industry that draws fiber over long distances dominates the primary manufacturing sector. The state also has numerous sawmills and specialty wood products mills. The wood energy sector has been reduced from the early 1990s.

¹ The preceding text was excerpted from the Maine Future Forest Economy Project: *Current Conditions and Factors Influencing the Future of Maine's Forest Products Industry*, March 2005.

TIMBER HARVESTING

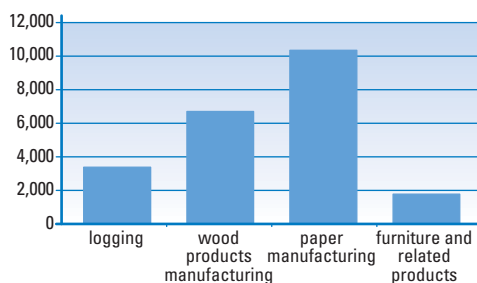
Figure 3 provides data on the harvesting, processing, importing, and exporting of wood products in Maine for the year 2002. During that year, 346 million board feet of hardwood sawlogs and 1.15 billion board feet of softwood sawlogs were harvested from Maine's forests, totaling 1.5 billion board feet. Maine's pulpwood harvest was 2.9 million cords. Over 1,763,009 green tons of whole tree chips were harvested. These chips are used primarily as fuel in wood-to-energy facilities. The Maine Forest Service estimates that total earnings by Maine landowners for the sale of standing timber in 2002 was \$224.7 million.

Figure 3. WOOD FLOW IN MAINE, 2002



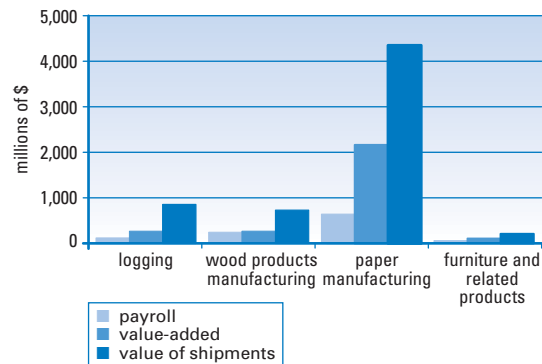
The logging industry is a significant portion of the employment base in northern Maine. The US Department of Commerce, Bureau of Economic Analysis, reported 3,039 individuals employed in this sector in Maine in 2003 (figure 4), with a payroll of \$103 million (figure 5). The US Bureau of the Census reports that the total value added for logging in 1997 was \$270 million and value of shipments was \$837 million (figure 5).

Figure 4. EMPLOYMENT IN FOREST-BASED MANUFACTURING, MAINE, 2003



Source: Bureau of Economic Analysis, 2003

Figure 5. PAYROLL, VALUE-ADDED, AND VALUE OF SHIPMENTS FOR FOREST-BASED MANUFACTURING INDUSTRIES, MAINE



Sources: Bureau of Economic Analysis, 2003 (payroll); US Bureau of the Census, 2001 (other)

Two "continuing education" programs are available to loggers in Maine. The Maine Certified Loggers program has trained and certified 2,125 loggers in safe, efficient, and environmentally sound harvesting practices. The Maine Sustainable Forestry Initiative (SFI), a program of the American Forest & Paper Association, has trained 4,000 loggers in standards established by a statewide committee. Maine has the greatest number of loggers trained to these standards and a commitment to SFI verification that far exceeds any other state.

PRODUCTION OF LUMBER AND RELATED SOLID WOOD PRODUCTS

Maine has a large softwood sawmill industry and a smaller hardwood one, due to the small tree sizes and modest quality of the hardwood resource. There are numerous sawmills and specialty wood products mills, as well as a small, but high-quality wooden furniture industry. In 2002, sawmills in Maine processed 366 million board feet of hardwood sawlogs and 872 million board feet of softwood sawlogs into lumber. Total pulpwood processed was 3.6 million cords.

The Bureau of Economic Analysis reports that there were 6,654 individuals employed in Wood Product Manufacturing in 2003 (figure 4), with wages and salaries totaling \$247 million. The Census Bureau reports that in 2001 the total value added for this sector in Maine was \$271 million and value of shipments was \$720 million (figure 5).

PULP AND PAPER MANUFACTURING

Maine’s manufacturing sector is dominated by pulp and paper manufacturing, which straddles the primary and secondary manufacturing base. There are eight major pulp and paper manufacturing companies operating in the state, which produce a wide variety of pulp and paper grades for specialty and fine papers, books, magazines, catalogues, tissue products, and microwave popcorn bags.

The Bureau of Economic Analysis reports that there were 10,216 individuals employed in Paper Manufacturing in 2003 (figure 4), with wages and salaries totaling \$638 million. The Census Bureau reports that in 2001 the total value added for this sector in Maine was \$2.1 billion and value of shipments was \$4.3 billion (figure 5).

WOOD ENERGY

Wood provides approximately 24% of electrical needs in Maine. Wood fiber and bark burned for energy are referred to as biomass and come from two sources: sawmill residue and land-clearing waste, and the tops and low quality stems of harvested trees (whole tree chips).

Biomass facilities include stand-alone electric generating plants or co-generating facilities that use the electricity to serve their own load and export surplus to the electrical grid. There are 10 stand-alone biomass plants operating in Maine that burned 1.9 million green tons of whole tree chips in 2002. Ten major industrial plants, including pulp, paper, and Oriented Strand Board mills, utilized 2.3 million green tons of wood waste and sawmill residues to generate electricity for their facilities. The biomass market provides an important outlet for low-grade wood, a material neither suitable nor economical to process for lumber or paper. Revenues from sales of whole tree chips in 2002 totaled \$13 million.

In 1998, 470,000 cords of firewood were harvested and processed in Maine, contributing \$44 million to the economy. These figures have not been updated.

Secondary Manufacturing

Secondary manufacturing refers to the drying, planing, cutting, and assembly of lumber into parts or finished products. Maine has a small secondary industry.

FURNITURE AND RELATED PRODUCT MANUFACTURING

The Bureau of Economic Analysis reports that there were 1,793 individuals employed in Furniture and Related Products in 2003 (figure 4), with wages and salaries totaling \$64 million. The Census Bureau reports that in 2001 the total value added for this sector in Maine was \$116 million and value of shipments was \$211 million (figure 5).

Associated Forest Products

In 2001 sales of maple products in Maine totaled \$3 million. The Maine Christmas Tree Growers Association estimates that sales of Christmas trees and greens totals \$10 million annually.

Gross State Product

Gross State Product (GSP) is a broad measure of economic activity corresponding to GNP at the national level. GSP is synonymous with value-added, which is sales minus raw materials and services inputs. Forest-based manufacturing contributed \$1.6 billion to Maine’s manufacturing GSP in 2002, which was 34% of the total manufacturing GSP (table 3).

Table 3. GROSS STATE PRODUCT, FOREST-BASED MANUFACTURING, MAINE, 2002

	<i>millions of \$</i>
Wood products manufacturing	\$312
Furniture and related product manufacturing	\$94
Paper manufacturing	\$1,192
Total	\$1,598
GSP, Manufacturing, Maine	\$4,671

Table 4. FOREST-BASED MANUFACTURING AND OTHER MANUFACTURING INDUSTRIES, MAINE

	# of employees	% of manufacturing employees	Payroll (\$1,000)	% of manufacturing payroll	Value added (\$1,000)	% of value-added all manufacturing	Value of shipments (\$1,000)	% of value of shipments all manufacturing
Forest-based manufacturing	21,692	33%	1,072,640	32%	2,526,752	32%	5,263,591	35%
All manufacturing	64,624		3,376,899		7,879,738		15,065,880	

Source: US Department of Commerce, Bureau of Economic Analysis, 2003 (employment and payroll); US Bureau of the Census, Annual Survey of Manufacturers, 2001 (value added and value of shipments)

The Position of Forest-based Manufacturing in the Maine Economy

Table 4 provides a comparison of the forest-based manufacturing sector (excluding logging) with the total manufacturing sector in Maine. Forest-based manufacturing provides 32% of the manufacturing payroll and employs 33% of manufacturing employees. This sector provides 32% of value added receipts in manufacturing and 35% of value of shipments receipts.

Forest-Related Recreation and Tourism

Most recreation and tourism activities in Maine are linked to the forest, but it is difficult to estimate the specific contribution made by the forest environment towards recreation and tourism expenditures. The recreation activities selected for this report take place primarily in a forest environment and include camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing. Attributing 100% of the economic contribution of these activities to forests is an overstatement, but 50% is an understatement. The author assumed three-quarters (75%) of each activity would not take place if there were no forests. That percentage was raised to 100% for fall foliage viewing.

Estimates of number of visitor, or participant, days engaged in for each selected recreation activity were drawn from the National Survey on Recreation and the Environment (NSRE) and by updating data from

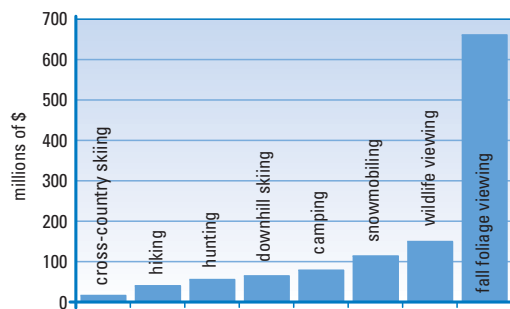
the 2001 NEFA reports (these reports used 1997 data, which was the most current available). For camping and hiking, the average number of visitor days per visit for the North region in the NSRE were used. For downhill skiing, cross-country skiing, sightseeing (fall foliage viewing) and snowmobiling, the 1997 numbers were updated using trend increases contained in the NSRE. Statewide Comprehensive Outdoor Recreation Plans (SCORP) for each state were used for the 2001 NEFA reports, but these are no longer available. Expenditure data per participant-day were updated using the Consumer Price Index. (The factor for converting 1997 prices to 2001 prices is 1.10.) There were no direct number of visitor-days developed for hunting and wildlife viewing. Instead, direct estimates of expenditures were taken from the National Survey of Fishing, Hunting, and Wildlife-Related Activities.

Estimates of impacts on employment and payroll were developed from ratios of employment or payroll to sales based on data for these in the 1997 Economic Census of the U.S. Bureau of the Census, since more recent economic censuses were not available. Present (2001) employment was calculated by first taking estimated 2001 sales and deflating it back to the 1997 datum, then applying the calculated ratio of sales to employment. For payroll, the estimate of sales to payroll was applied directly to the 2001 sales results.

The recreation activities included in this report contribute 1.16 billion dollars in sales to the Maine economy. The portion attributed to the forest

resource is 1.02 billion dollars. These are distributed among purchases at food and beverage stores, automobile gasoline service stations, accommodations (lodging places), eating and drinking establishments, and a host of other retail trade or service sectors. Fall foliage viewing is largest contributor with about half of the total sales, and wildlife viewing is second (figure 6). About 12,000 people are directly employed with payrolls of \$145 million due to forest-related recreation in Maine.

Figure 6. FOREST-RELATED RECREATION AND TOURISM EXPENDITURES, MAINE, 2001



Source: NEFA, 2004

Conclusion

The economic importance of Maine's forests is significant. The forest products sector is a consistent provider of income and employment for thousands of rural residents and forest landowners. The sale of forest products adds over \$5.2 billion in direct payments to the state's economy. Additionally, the forest attracts millions of visitors to the state for recreation and tourism activities, contributing \$1.02 billion. Altogether, the contribution of forest-based manufacturing and forest-related tourism and recreation to the Maine economy is over \$6.2 billion.

SOURCES OF DATA AND TEXT EXCERPTS

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NEFA'S MISSION

To encourage sound decisions about the management and use of forest resources in the NEFA region by identifying significant regional trends, broadening awareness of forest health and sustainability issues, providing a regional context for state and local decisions about forest resources, and analyzing the environmental, social, and economic impacts of forest land use.

This series of reports, as well as other NEFA publications, and additional information about NEFA can be found at www.nefainfo.org

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