

The Economic Importance of New Hampshire's Forests

North East State Foresters Association
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New Hampshire is the second most forested state in the nation, with 84% of the state's total land area covered with trees. The forest contributes to our quality of life in many ways. It plays a significant role in our state's economy and provides the backdrop for forest-related recreation. 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 reports adds to your understanding of the opportunities and values provided by the forests of New Hampshire.

PHILIP BRYCE, Director,
New Hampshire Division of Forests and Lands

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 and 2002 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 and 2002 data.*

HIGHLIGHTS

- The annual contribution of forest-based manufacturing and forest-related tourism and recreation to the New Hampshire economy is more than **\$2.6 billion**.
- Forest-based manufacturing provided **\$1.7 billion in value of shipments** to the economy in 2001. This is 9.5% of the statewide value for manufacturing.
- Revenues from forest-related recreation and tourism activities totaled **\$940 million** in 2001.
- The forest-based manufacturing economy provides employment for over 9,800 people and generated payrolls of **\$333 million**. Forest-based recreation and tourism provides employment for almost 11,000 and generates payrolls of **\$159 million**.
- New Hampshire landowners received estimated stumpage revenue in 2002 of **\$34.4 million**. Taxes paid to municipalities for timber harvesting was **\$3.4 million**.
- Wood biomass provides approximately 5.8% of energy use in New Hampshire annually. Revenues from sales of biomass chips totaled **\$12.4 million** in 2003. Sales from cordwood are valued at **\$9.3 million** annually.
- The sale of Christmas trees, wreaths, and maple syrup contributes **\$17.5 million**.
- Each 1,000 acres of forestland in New Hampshire supports 2.0 forest-based manufacturing jobs, with a payroll of \$71,000, and 2.3 forest-related tourism and recreation jobs, with a payroll of \$33,830.

TABLE 1. ANNUAL REVENUES FROM NEW HAMPSHIRE'S FORESTS
Total values and per acre basis

	Millions of \$	\$ per acre
Forest-based manufacturing value of shipments	1,674.0	351.0
Forest-related recreation and tourism	940.0	197.0
Christmas trees/maple products	17.5	3.6
Totals	2,631.5	551.6

The Forest Resource in New Hampshire

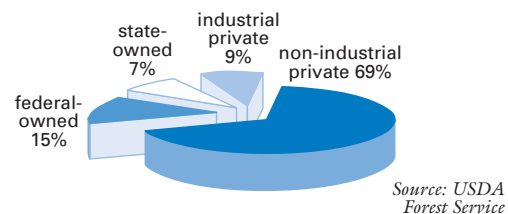
New Hampshire covers 5.7 million acres. Eighty-four percent, or 4.7 million acres, is forested. Of these forested acres, 4.5 million acres (93%) are classified as timberland by the USDA Forest Service, or land that is fertile and accessible enough to produce wood as a crop and is not withdrawn from timber harvesting by statute or regulation (table 2).

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

Total land area	Forest land	Timberland
5,740,000	4,771,100	4,661,700

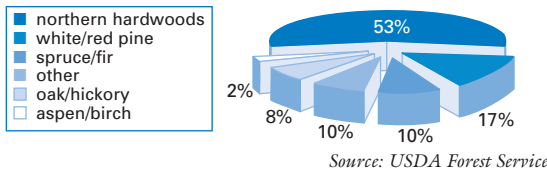
The majority of forestland in New Hampshire (3,714,800 acres or 78%) is privately owned by industrial and non-industrial owners. State and federal government own 1,056,300 acres, or 22% of forestland (figure 1).

FIGURE 1. TIMBERLAND OWNERSHIP, NEW HAMPSHIRE, 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 New Hampshire (figure 2) and covers 2.5 million acres (53%), followed by the white/red pine, oak/hickory, spruce/fir, and aspen/birch types.

Figure 2. FOREST TYPES, NEW HAMPSHIRE, 2002



Forest-based Manufacturing

The forest-based manufacturing system includes 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, some of which go out of state for 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 in New Hampshire convert the raw material into finished products. These businesses may purchase lumber from a broker, who may supply wood from outside New Hampshire. Pulpwood is imported and exported.

The US Bureau of the Census collects and analyzes data on all aspects of the economy. The Census Bureau's Annual Survey of Manufacturers (2001) is the source of most of the federal economic data for this publication. The Census Bureau typically undercounts activity in each manufacturing sector, especially in regards to smaller firms, which are abundant in forest-based industries. The Census data given should be treated as minimums, with the understanding that actual values are likely to be higher.

Primary Manufacturing

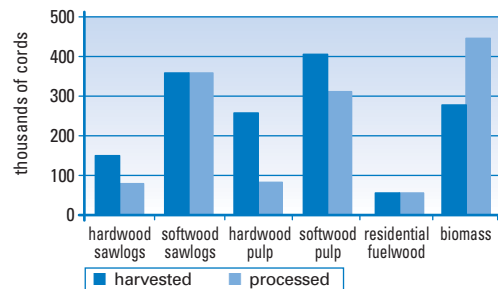
The conversion of roundwood, or parts of trees, into lumber, veneer, pulp, and paper starts with the primary manufacturing sectors. In New Hampshire, lumber and related solid wood products made in sawmills and paper produced in woodpulp and paper mills are the major primary processing activities. There is also a wood energy sector.

Timber Harvesting

Sawtimber stands cover 52% of timberland in New Hampshire, and contribute to an active level of harvesting. Most forest land in New Hampshire is privately owned by individual landowners who sell their standing trees as "stumpage." In 2002, the total sale of stumpage earned by New Hampshire landowners was \$34.4 million. A 10% yield tax or timber tax on the harvesting of timber must be paid to the municipalities the timber was removed from. During 2002, payments totaled approximately \$3.4 million.

Figure 3 provides data on the harvest of wood products in New Hampshire for the year 2002. During that year, 70.4 million board feet of hardwood sawlogs and 178 million board feet of softwood sawlogs were harvested from New Hampshire's forests, totaling 248.4 million board feet. New Hampshire's pulpwood harvest was 651,398 cords. Harvest of whole tree chips was 691,751 green tons, or 276,700 cords. These chips are used primarily as fuel in wood-to-energy facilities. They are also used in sludge composting, playground padding, and mulch.

Figure 3. WOOD HARVESTED AND PROCESSED IN NEW HAMPSHIRE, 2002



1,000 board feet = 2 cords
1 cord = 2.5 green tons
New Hampshire Department of Resources & Economic Development

The logging industry in New Hampshire is an important source of employment in northern New Hampshire. The New Hampshire Timber Harvesting Council estimates there are 1,500 loggers operating in New Hampshire. Over 1,000 of them participate in a voluntary certification program that promotes safety and environmental awareness.

Census data in this category (NAICS 113310 — Logging) includes cutting and transporting timber and has not been updated since the last Economic Census in 1997. In New Hampshire, in 1997, the Census Bureau reported that there were 601 individuals employed in this sector (figure 4), with a payroll of \$13.2 million (figure 5). These numbers are certainly low, considering that over 1,000 participate in a voluntary program. The Census Bureau reports that the total value added for logging in 1997 was \$36.2 million and value of shipments was \$60.2 million (figure 5).

Figure 4. EMPLOYMENT IN FOREST-RELATED MANUFACTURING, NEW HAMPSHIRE

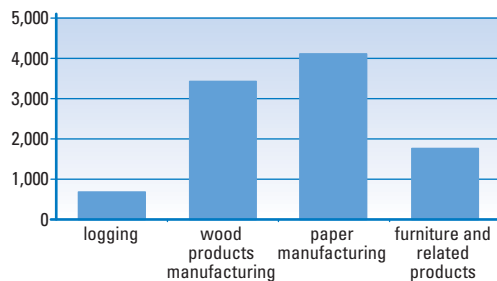
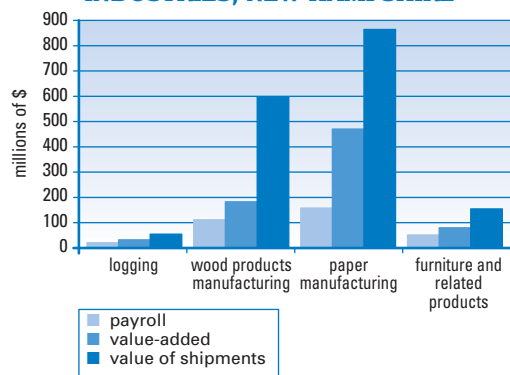


Figure 5. PAYROLL, VALUE-ADDED, AND VALUE OF SHIPMENTS FOR FOREST-BASED MANUFACTURING INDUSTRIES, NEW HAMPSHIRE



Sources of data for Figures 4 and 5:
 US Bureau of the Census, 1997 Economic Census (logging);
 US Bureau of the Census, Annual Survey of Manufacturers, 2001 (other)

Production of Lumber and Related Solid Wood Products

Although the number of sawmills in New Hampshire has decreased from 500 to about 100, these mills have a production output almost as large as four decades ago, due to improved machinery and greater yield from each log. In 2002, sawmills in New Hampshire processed 41 million board feet of hardwood sawlogs and 178 million board feet of softwood sawlogs into lumber. Cords of pulpwood processed during 2002 totaled 651,398 cords (figure 3).

Census data for sawmills is included in Wood Products Manufacturing (NAICS 321). The sector also includes wood preservation, millwork, wood container and pallet manufacturing, and prefabricated wood buildings. In New Hampshire in 2001, there were 3,401 individuals employed in this sector (figure 4), with a payroll of \$176.8 million. The total value added for wood products manufacturing was \$456.6 million and the value of shipments was \$598.4 million (figure 5).

Pulp and Paper Manufacturing

Several large plants in northern New Hampshire anchor the pulp and paper industry, with other facilities dispersed statewide. Census data in this category (NAICS 322 — Paper manufacturing) includes pulp, paper and paperboard mills, and converted paper product manufacturing. In 2001, there were 4,121 individuals employed in this sector (figure 4), with a payroll of \$158.4 million. The total value added for paper manufacturing was \$858.0 million and the value of shipments was \$858.0 million (figure 5).

Wood Energy

Wood provides 5.8% of electrical and heating needs in New Hampshire. Wood fiber and bark burned for energy are referred to as biomass and come from two sources: sawmill residue and land-clearing waste (hogfuel), and from tops and low quality stems of harvested trees (whole tree chips). Five biomass plants consume 1.1 million tons of chips per year.

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 biomass chips in 2003 totaled \$12.45 million (assuming \$18.00/ton). Sellers of commercial cordwood reported cutting 45,696 cords in 2001, valued at \$9.3 million.

Secondary Manufacturing

Secondary manufacturing refers to the drying, planing, cutting, and assembly of lumber into parts or finished products. A diversity of trees growing in New Hampshire contributes to a growing secondary industry, composed of several hundred dispersed companies that provide jobs and economic stability to mostly rural communities. Cabinets, moulding, clapboards, caskets, and canoe and kayak paddles are just a sample of items produced in these businesses.

Furniture and Related Products

Census data in this category (NAICS 337 — Furniture and related products) includes wood kitchen cabinet and countertop manufacturing, non-upholstered wood household furniture manufacturing, and custom architectural woodwork and millwork manufacturing. In 2001, there were 1,717 individuals employed in this sector (figure 4), with a payroll of \$50.0 million. The total value added for furniture & related products was \$67.6 million and the value of shipments was \$158.5 million (figure 5).

Associated Forest Products

Sales of maple products in 2001 totaled \$1.7 million. Estimated sales of Christmas trees and wreaths totaled \$15 million.

The Position of Forest-based Manufacturing in the New Hampshire Economy

Table 3 provides a comparison of the forest-based manufacturing sector with the total manufacturing sector in New Hampshire. Forest-based manufacturing provides 8% of the manufacturing payroll and employs 10% of manufacturing employees. This sector provides 8% of value added receipts in manufacturing and 9.5% of value of shipments receipts. These percentages have not changed since the 1997 Economic Census, which was the source of data for NEFA's previous report. The Economic Census provided more comprehensive data, including additional information on the rank of forest-based manufacturing within New Hampshire's manufacturing economy. According to that 1997 source of data, forest-based manufacturing ranked third to Computer and electronic products manufacturing (42%) and Machinery manufacturing (9%) in value of shipments. Since forest-based manufacturing continues to provide equivalent percentages of employees, payroll, value added, and value of shipments for New Hampshire, the sector is still positioned highly in the manufacturing economy.

Table 3. FOREST-BASED MANUFACTURING AND OTHER MANUFACTURING INDUSTRIES, NEW HAMPSHIRE, 2001

	# 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	9,801	10%	333,200	8%	701,126	8%	1,614,661	9.5%
All manufacturing	96,715		3,974,521		8,621,333		16,974,841	

Source: US Bureau of the Census, Annual Survey of Manufacturers

Forest-related Recreation and Tourism

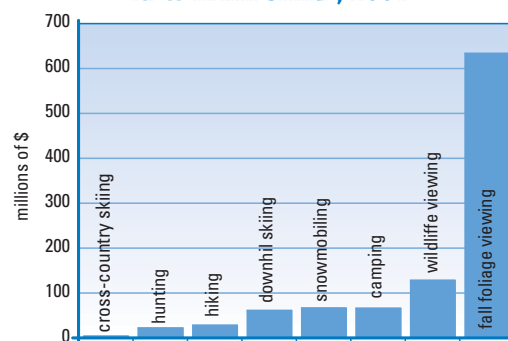
Most recreation and tourism activities in New Hampshire are linked to the forest, but it is difficult to estimate the specific contribution made by the forest environment towards recreation and tourism expenditures. The recreation activities selected for this report take place primarily in a forest environment and include camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing. There were no hiking data available for New Hampshire. 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. The 2004 NH Statewide Comprehensive Outdoor Recreation Plans (SCORP) also used these data. 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 1.07 billion dollars in sales to the New Hampshire economy. The portion attributed to the forest resource is \$940 million. 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 two-thirds of the total sales with wildlife viewing second (figure 6). About 11,000 people are directly employed with payrolls of \$159 million due to the forest-related recreation and tourism in New Hampshire.

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



Source: NEFA, 2004

Conclusion

The economic importance of New Hampshire's forests is significant. In a predominantly rural state, the forest provides important jobs and payroll for almost 10,000 people, and a significant source of income for forest landowners. The sale of forest products adds over \$1.7 billion to the state's economy and represents 10% of manufacturing receipts in a diverse manufacturing economy. Additionally, the forest attracts millions of visitors to the state for recreation and tourism activities, contributing \$940 million. Altogether, the direct contribution of forest-based manufacturing and forest-related recreation and tourism to the New Hampshire economy is over \$2.6 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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