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 http://nefa.conknet.com.

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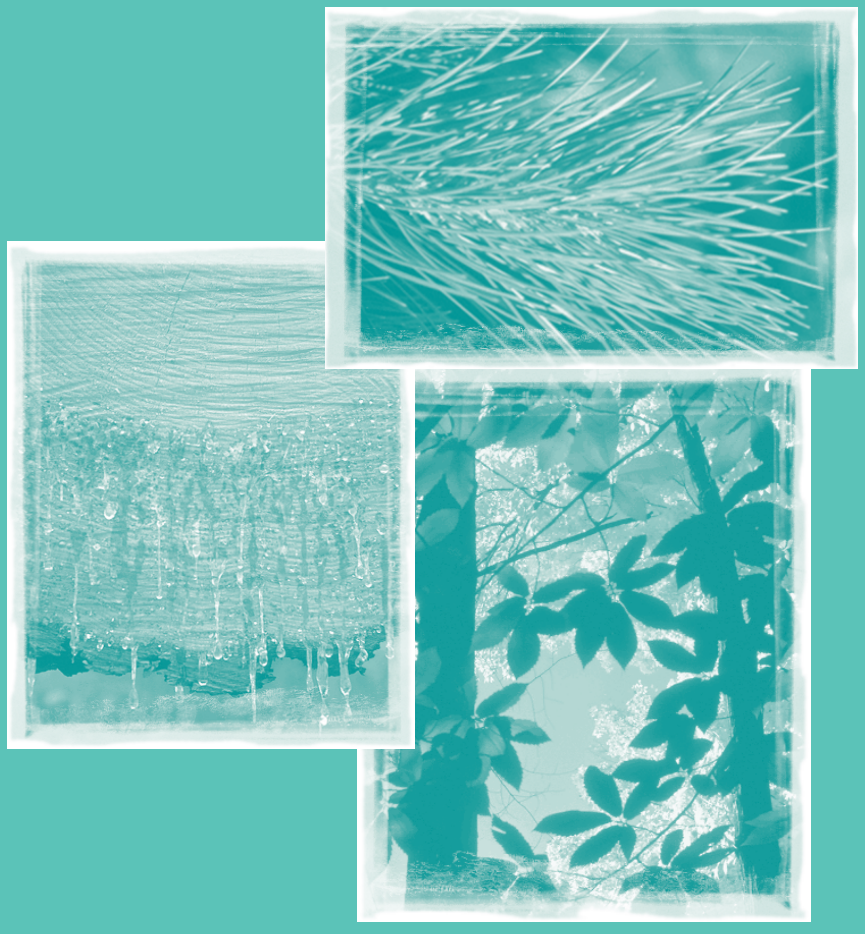
The Economic Importance of New Hampshire's Forests



North East *State* Foresters Association
March 2001

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.

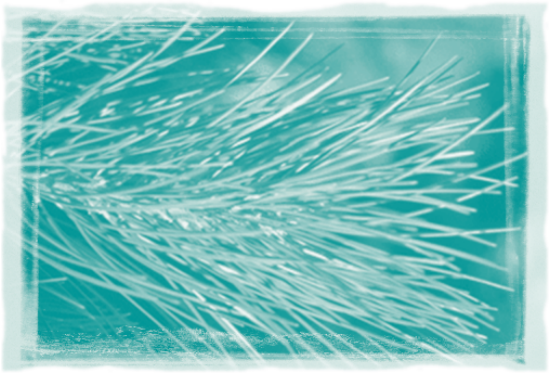
I hope this reports adds to your understanding of the opportunities and values provided by the forests of New Hampshire.

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

The economic importance of New Hampshire's forests

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 — New York, Vermont, New Hampshire, and Maine. A regional report is also available. Each report includes an overview of the land base in each state and a summary of federal and state data 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. 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.



HIGHLIGHTS

- The contribution of forest-based manufacturing and forest-related tourism and recreation to the New Hampshire economy is more than **$2 billion** (table 1).
- Forest-based manufacturing is the third largest manufacturing industry in New Hampshire, providing **$1.5 billion in value of shipments** to the economy in 1997. This is 8% of the statewide value for manufacturing.
- Revenues from forest-related recreation and tourism activities totaled **$509 million** in 1997.
- The forest-based manufacturing economy provides employment for almost 9,400 people and generates payrolls of **$290 million.** Forest-based recreation and tourism provides employment for almost 3,800 and generates payrolls of **$54 million.**
- New Hampshire landowners received estimated stumpage revenue in 1997 of **$37 million.** Taxes paid to municipalities for timber harvesting was **$4.1 million.** Estimated total value of these roundwood products delivered to mills was **$132 million.**
- Wood biomass provides approximately 6% of energy use in New Hampshire annually. Revenues from sales of biomass chips totaled **$15.6 million** in 1997. Sales from cordwood are valued at **$35 million.**
- The sale of Christmas trees, wreaths, and maple syrup contributes **$8.7 million.**
- Each 1,000 acres of forestland in New Hampshire supports 1.9 forest-based manufacturing jobs and 0.8 forest-related tourism and recreation jobs.

Table 1. REVENUES FROM NEW HAMPSHIRE'S FORESTS

	millions of $	*$ per acre*
Forest-based manufacturing value of shipments	1,500	313
Forest-related tourism and recreation expenditures	509	106
Christmas trees/maple products	9	2
Totals	**2,018**	**421**

The Forest Resource in New Hampshire

New Hampshire's forested ecosystem provides the basis for biological diversity, natural communities, wildlife habitats, and scenic landscapes. The forests of New Hampshire also provide an important economic base for employment, tourism, and recreation, and support a diverse forest products industry. The state of New Hampshire is blessed with abundant forests. Today, New Hampshire ranks as the second most forested state in the country (following Maine).

Land area

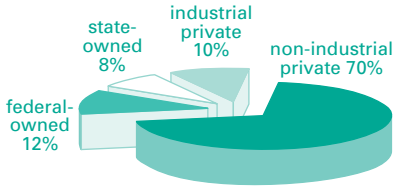
New Hampshire covers 5.7 million acres. Eighty-four percent, or 4.8 million acres, is forested. Of these forested acres, 4.5 million acres (93%) are classified as timberland by the USDA Forest Service, or land that is fertile and accessible enough to produce wood as a crop and is not withdrawn from timber harvesting by statute or regulation (table 2).

Table 2. TOTAL LAND AREA, FOREST LAND ACRES, AND TIMBERLAND ACRES, NEW HAMPSHIRE, 1997

total land area	*forest land*	*timberland*
5,740,000	4,824,000	4,509,000

Source: USDA Forest Service

Figure 1. TIMBERLAND OWNERSHIP, NEW HAMPSHIRE, 1997

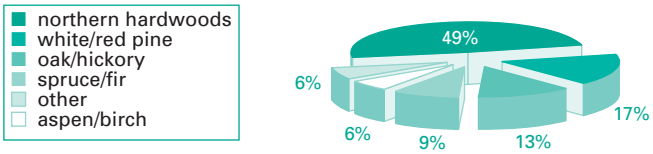


Source: USDA Forest Service

The majority of timberland in New Hampshire (3.6 million acres or 80%) is privately owned by industrial and non-industrial owners. State and federal government own 886,500 acres, or 20% of timberland (figure 1).

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 2.2 million acres (49%), followed by the white/red pine, oak/hickory, spruce/fir, and aspen/birch types.

Figure 2. FOREST TYPES, NEW HAMPSHIRE, 1997



Source: USDA Forest Service

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, some of which go out of state for processing. Primary manufacturers convert raw material into lumber, veneer, pulp, and paper.

According to the National Association of Home Builders, the average American home of 2,200 square feet uses 17,000 board feet in lumber. Using this figure, New Hampshire's 1997 sawlog harvest of 461 million board feet could build 15,588 homes. The 1997 pulpwood harvest of 555,000 cords could produce 11 million reams of paper (1 ream=500 sheets).

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 may supply wood from outside New Hampshire. Pulpwood is imported and exported.

Most of the data used for this series of publications are from the 1997 U.S. Bureau of Census, Census of Manufacturing, NAICS Series (North American Industrial Classification). Prior to September 2000, these data were available under SIC codes (Standard Industrial Classification). Comparison of SIC and NAICS is difficult because of several changes. Logging is now under a separate sector. Also, the SIC category for Furniture and Fixtures previously included non-wood materials. The NAICS system separates wood from metal and other materials, so the data are more reliable, but the totals are inevitably lower.

The Census of Manufacturing typically undercounts the activity in each sector, especially in regards to smaller firms, which are abundant in New Hampshire. Data developed by state sources are used when possible. The Census data given should be treated as minimums, with the understanding that actual values are likely to be higher.

Primary manufacturing

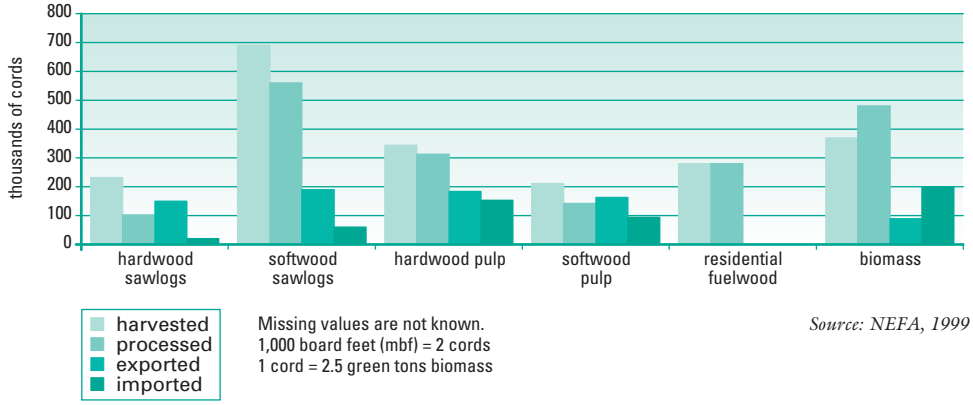
The conversion of roundwood, or parts of trees, into lumber, veneer, pulp, and paper starts with the primary manufacturing sectors. In New Hampshire, lumber and related solid wood products made in sawmills and paper produced in woodpulp and paper mills are the major primary processing activities. There 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 is New Hampshire is privately owned by individual landowners who sell their standing trees as "stumpage." In 1998, the total sales of stumpage earned by New Hampshire landowners was $37 million. Sales of these products to sawmills (referred to as delivered roundwood) is estimated at $132 million [1]. A 10% yield tax or timber tax on the harvesting of timber must be paid to the municipalities the timber was removed from. During 1997, payments totaled $4.1 million.

Figure 3 provides data on the harvesting, processing, importing, and exporting of wood products in New Hampshire for the year 1997. During that year, 116 million board feet of hardwood sawlogs and 345 million board feet of softwood sawlogs were harvested from New Hampshire's forests, totaling 461 million board feet. New Hampshire's pulpwood harvest was 555,000 cords. Almost one million green tons of whole tree chips were harvested. These chips are used primarily as fuel in wood-to-energy facilities. They are also used in sludge composting, playground padding, and mulch.

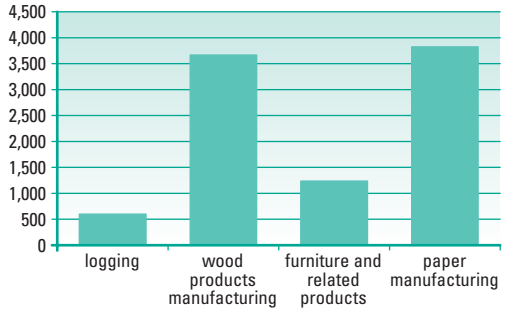
Figure 3. WOOD FLOW, NEW HAMPSHIRE, 1997



Source: NEFA, 1999

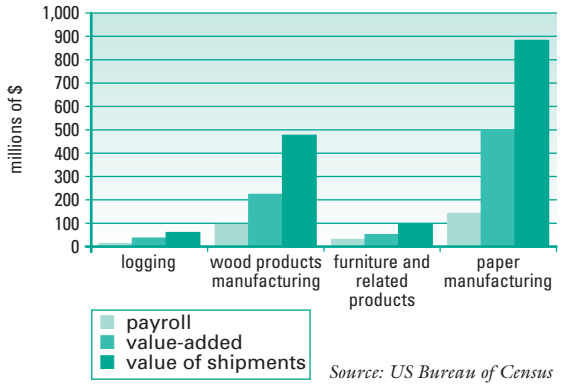
The logging and log trucking industry in New Hampshire is a significant portion of the employment base in northern New Hampshire. The New Hampshire Timber Harvesting Council estimates there are 1,300 loggers operating in New Hampshire. Over 1,000 of them participate in a voluntary certification program that promotes safety and environmental awareness.

Figure 4. EMPLOYMENT IN FOREST-BASED MANUFACTURING INDUSTRIES, NEW HAMPSHIRE, 1997



Source: US Bureau of Census

Figure 5. PAYROLL, VALUE-ADDED, AND VALUE OF SHIPMENTS FOR FOREST-BASED MANUFACTURING INDUSTRIES, NEW HAMPSHIRE, 1997



Source: US Bureau of Census

Census data in this category (NAICS 113310) includes cutting and transporting timber. In 1997, the Census Bureau reported that there were 601 individuals employed in this sector (figure 4), with a payroll of $13.2 million. This number is certainly low, considering that over 1,000 are participating 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).

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 1997, sawmills in New Hampshire processed 42 million board feet of hardwood sawlogs and 280 million board feet of softwood sawlogs into lumber (figure 3).

Census data for sawmills is included in Wood Products Manufacturing (NAICS 321). The sector also includes wood preservation, millwork, wood container & pallet manufacturing, prefabricated wood buildings, and other. In New Hampshire in 1997, there were 3,665 individuals employed in this sector (figure 4), with a payroll of $94.6 million. The total value added for Wood Products Manufacturing was $223.4 and value of shipments was $476.1 million (figure 5).

Wood harvest and consumption in New Hampshire

Based upon consumption data from The American Forest and Paper Association (AF&PA), an industry trade group, the citizens of New Hampshire use 711 million board feet or 1,422,000 cords of wood per year. The current harvest of sawlogs, pulpwood, residential fuel, and biomass in New Hampshire, plus imports and minus exports, equals 1,877,200 cords. According to these calculations, New Hampshire supplies more wood than its' citizens consume.

New Hampshire is an overall net importer of natural resources. While agriculture remains an important part of the economy and way of life, only 2-3% of food consumed in New Hampshire in 2000 was produced in the state. New Hampshire produces little of the other natural resources consumed in the state, including oil, gas, and minerals. Although the Governor's Office of Energy and Community Services estimates that a sustainable yearly biomass harvest of 1.2 million tons could supply energy to 127,872 households (or 29%), biomass currently supplies only 6% of residential and industrial energy needs.

Harvesting and processing wood from the forests of New Hampshire fulfills a social responsibility to provide some of the natural resources consumed within the state. This emphasizes the importance of sustaining the forest resource and supporting the forest industry for the long term.

Wood energy

Wood provides 6% 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 (hog-fuel), and from tops and low quality stems of harvested trees (whole tree chips). Six biomass plants consume 1.2 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 1997 totaled $15.6 million.

The firewood market has declined significantly since a peak in the early 1980's, but recent increases in home heating fuel prices is contributing to renewed interest in wood as residential fuel, with accompanying increases in demand and price. In 1997, 280,000 cords of firewood were harvested and processed in New Hampshire, contributing $35 million to the economy.

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. Flooring, furniture, baseball bats, and tongue depressors are just a sample of items produced in these businesses.

Furniture and related products

Census data in this category (Furniture & related products- NAICS 337) includes wood kitchen cabinet & countertop manufacturing, non-upholstered wood household furniture manufacturing, and custom architectural woodwork and millwork manufacturing. In 1997, there were 1,238 individuals employed in this sector (figure 4), with a payroll of $30.8 million. The total value added for Furniture & related products was $51.1 million and value of shipments was $94.5 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) includes pulp, paper, & paperboard mills and converted paper product manufacturing. In 1997, there were 3,822 individuals employed in this sector (figure 4), with a payroll of $142.2 million. The total value added for paper manufacturing was $500.6 million and value of shipments was $882.4 (figure 5).

The position of forest-based manufacturing in the New Hampshire economy

The wood-using industry is among the state's leading manufacturers, ranking third to Computer & electronic product manufacturing and Machinery manufacturing in value of shipments (table 3). Manufacturing is the leading economic sector in New Hampshire, followed by wholesale trade and retail trade.

Table 3. FOREST-BASED MANUFACTURING AND OTHER MANUFACTURING INDUSTRIES, NEW HAMPSHIRE, 1997

	# of businesses	% of manufacturing businesses	value of shipments ($1,000)	% of value of shipments, all manufacturing	payroll ($1,000)	% of manufacturing payroll	# of employees	% of manufacturing employees
Computer/electronic products manufacturing	271	11	8,323,698	42	921,601	27	22,878	23
Machinery manufacturing	206	9	1,811,315	9	423,386	12	10,660	11
Forest-based manufacturing	313	20	1,516,233	8	289,591	8	9,325	9
Fabricated metal products manufacturing	454	19	1,470,406	7	421,578	12	12,971	13
Electrical equipment, appliance, component manufacturing	55	2	1,010,505	5	174,700	5	5,558	6

Source: US Bureau of Census

Associated forest products

New Hampshire's forests provide other commodities besides timber and pulp. In 1998 sales of maple products totaled $2.7 million. Sales of Christmas trees and wreaths totaled $6 million.

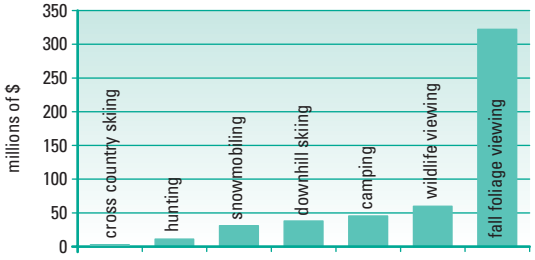
Forest-related Recreation and Tourism

It is difficult to quantify the 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.

Participation data in these recreational activities were obtained from various state and federal sources. State total estimates of employment and sales in retail trade and service sectors of the economy were taken from the 1997 Eco-

nomic Census of the U.S. Bureau of the Census. These were divided into Food and Beverage Stores, Gas Stations, Accommodations, Eating and Drinking Establishments, and Other Retail. Number of activity days were applied to expenditure per activity day per participant by category (food and beverage, gas, etc.) to get the final values for expenditures, payroll, and employment.

Figure 6. FOREST-RELATED RECREATION AND TOURISM EXPENDITURES, NEW HAMPSHIRE, 1997



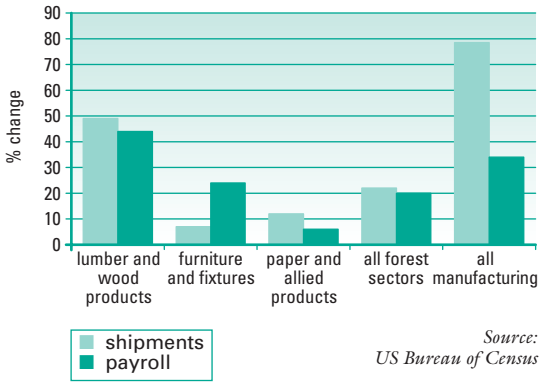
Source: NEFA, 2000

The outdoor recreation activities included in this report directly contribute $600 million dollars in sales to the state's economy. The contribution of the forests of New Hampshire to the recreation expenditures is estimated at $509 million. Accommodations and the Other category accounted for the largest share of expenditures. Fall foliage viewing makes the largest contribution followed by wildlife viewing, camping, and downhill skiing (figure 6).

Forest-related recreation and tourism provide employment for 3,796 individuals and a payroll of $54 million. Statewide, the direct impact is 3% of all sales or employment in the selected sectors. However, recreation spending accounts for almost half (44%) of sales and employment in accommodations. These jobs are important to many rural areas, where there are few alternative employment opportunities.

Industry Trends

Figure 7. PERCENT CHANGE IN VALUE OF SHIPMENTS AND PAYROLL, FOREST-BASED INDUSTRIES, NEW HAMPSHIRE, 1992-1997



Source: US Bureau of Census

Between 1992 and 1997, all sectors of New Hampshire's forest industry saw significant increases in the value of shipments (figure 7). For businesses classified under the SIC codes as Lumber and wood products, primarily sawmills, shipments increased by almost 50% during this time period. During this same time period, the value of shipments from all Lumber and wood products manufacturers in the United States increased by 30%. The value of shipments by businesses engaged in manufacturing Furniture and fixtures, which includes some businesses that do not use wood, increased by 7% during this time period. Paper and allied products, primarily pulp and paper mills, increased the value of their shipments by 12%. The value of shipments by all New Hampshire forest industries, a combination of Lumber, Furniture and Paper, increased by 22% from 1992–1997.

The payroll of New Hampshire forest industries grew consistently between 1992 and 1997, with all sectors showing an increased payroll of 20% (figure 7). Lumber and wood products payroll grew by 44% over this time period, compared to

26% growth in this sector nationally. Payroll for Furniture and fixture manufacturers grew by 24%, equal to the national average. Payroll in Paper and allied products grew by 6%, significant given a 17% reduction in number of employees during this same time period.

Conclusion

The economic importance of New Hampshire's forests is significant. In a predominantly rural state, the forest provides important jobs and payroll for thousands of people and a significant source of income for forest landowners. The sale of forest products adds over $1.5 billion to the state's economy. Additionally, the forest attracts millions of visitors to the state for recreation and tourism activities, contributing $509 million. Altogether, the direct contribution of forest-based manufacturing and forest-related tourism and recreation to the New Hampshire economy is over $2 billion.

(1) Calculations for estimated delivered roundwood were arrived at by calculating an average delivered value for sawlogs, pulpwood, and biomass from values given in the New Hampshire Forest Products Report, 1999, and applying that average to the total harvest of each product from the NEFA wood flow report (1999).

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