



The Economic Importance of the Northeast's Forests

North East *State* Foresters Association
DECEMBER 2004*

This report 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. Individual state reports are available online at nefainfo.org and in hard copy. The reports include an overview of the land base in each state and a summary of federal and state data from 2001 to 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

- The annual contribution of forest-based manufacturing and forest-related tourism and recreation to the NEFA economy is more than **\$19.5 billion**.
- Forest-based manufacturing provided **\$15.5 billion in value of shipments** to the economy in the NEFA states in 2001.
- Revenues from forest-related recreation and tourism activities totaled **\$4 billion** in 2001.
- The forest-based manufacturing economy provides employment for almost 90,000 people and generates payrolls of **\$3 billion**. Forest-based recreation and tourism provides employment for 43,500 and generates payrolls of **\$645 million**.
- Forest landowners in the NEFA region received estimated stumpage revenue in 2002 of **\$539 million**.
- Wood biomass provides approximately 6% of energy use in New Hampshire and Vermont, and 24% of energy use in Maine annually. Revenues from sales of biomass chips in the four states totaled **\$36.9 million** in 2002. Sales from cordwood are valued at **\$179 million**.
- The sale of Christmas trees and maple syrup contributed **\$67 million**.
- Each 1,000 acres of forestland in the NEFA region supports two forest-based manufacturing jobs with a payroll of \$66,666 and one forest-based tourism and recreation job with a payroll of \$15,000.

Table 1. ANNUAL REVENUES FROM NEFA'S FORESTS
Total values and per acre basis

	<i>Millions of \$</i>	<i>\$ per acre</i>
Forest-based manufacturing value of shipments	15,536	345
Forest-related recreation and tourism	3,990	88
Christmas trees/maple products	67	1.56
Totals	19,593	435

The Forest Resource in the NEFA Region

The NEFA region's forested ecosystem provides the basis for biological diversity, natural communities, wildlife habitats, and scenic landscapes. The forests of the NEFA region also provide an important economic base for employment, tourism, and recreation, and support a diverse forest products industry. Maine is the most forested state in the United States, followed by New Hampshire.

Land Area

The NEFA region covers 61.8 million acres. Seventy-four percent, or 45.6 million acres, is forested. Of these forested acres, 42.2 million acres (92%) 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).

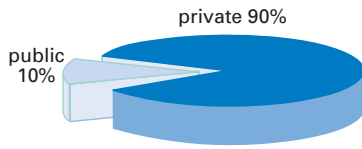
Table 2. TOTAL LAND AREA, FOREST LAND AND TIMBERLAND ACRES, NEW YORK (2004), VERMONT (1997), NEW HAMPSHIRE AND MAINE (2002)

<i>Total land area</i>	<i>Forest land</i>	<i>Timberland</i>
61,810,994	45,578,700	42,258,755

Source: USDA Forest Service

The majority of timberland in the NEFA region (37.9 million acres or 90%) is privately owned by industrial and non-industrial owners. State and federal government own four million acres, or 10% of timberland (figure 1).

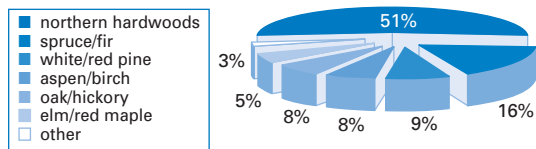
Figure 1. TIMBERLAND OWNERSHIP, NEFA REGION



Source: USDA Forest Service, NY (2004), VT (1997), NH & ME (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 the NEFA region (figure 2) and covers 21 million acres (50%), followed by the spruce/fir, white/red pine, aspen/birch, oak/hickory, and elm/red maple types.

Figure 2. TIMBERLAND TYPES, NEFA REGION



Source: USDA Forest Service, New York (2004), Vermont (1997), NH and Maine (2002)

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. 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 the NEFA region. Pulpwood is imported and exported.

This report includes several economic indicators on forest-based manufacturing that are provided by the federal government. The US Department of the Census's Annual Survey of Manufacturers (2001) is the source of most of the federal economic data for New York, Vermont, and New Hampshire in this publication, including number of employees, payroll,

value-added contributions, and value of shipments. All federal data on logging for New York, Vermont, and New Hampshire was provided by the US Bureau of Census, 1997 Economic Census, which is the most recent data available for this sector. Employment and payroll data for Maine are taken from the US Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, 2003. Data for all other economic indicators in Maine are taken from the 2001 Annual Survey of Manufacturers.

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. Data sources for the harvesting and processing of forest products were provided by each state.

Primary Manufacturing

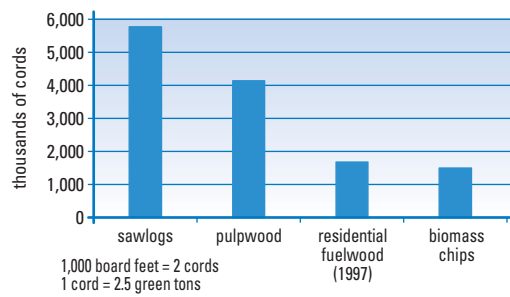
The conversion of roundwood, or parts of trees, into lumber, veneer, pulp, and paper starts with the primary manufacturing sectors. In the NEFA region, lumber and related solid wood products made in sawmills and paper produced in woodpulp and paper mills are the major primary processing activities. There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

Timber Harvesting

Most forest land in the NEFA region is privately owned by small non-industrial owners who sell their standing trees as "stumpage." Total sales of stumpage earned by NEFA region landowners are estimated at \$539 million.

In 2002, 1,018 million board feet of hardwood sawlogs and 1,389 million board feet of softwood sawlogs were harvested from the NEFA region's forests, totaling 2,764 million board feet or 5,528 million cords. The NEFA region's pulpwood harvest was 4,034 million cords (figure 3). Cordwood harvested in the NEFA region averages about 1.6 million cords per year. More than three 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 HARVESTED IN THE NEFA REGION, 2002

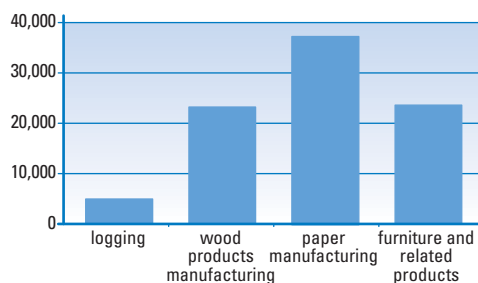


Source: State Natural Resource Agencies

The logging industry in the NEFA region is a significant portion of the employment base in rural areas. Maine, Vermont, and New Hampshire have voluntary certification programs for timber harvesters that promote safety and environmental awareness.

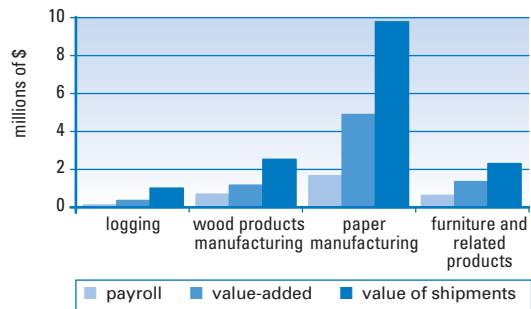
Census data in this category (NAICS 113310) includes cutting and transporting timber and has not been updated since the last Economic Census in 1997. In 1997, the Census Bureau reported that there were 4,252 individuals employed in this sector (figure 4), with a payroll of \$460 million in New York, Vermont, and New Hampshire (figure 5). The US Bureau of the Census, Bureau of Economic Analysis, reported that 3,039 individuals were employed in this sector in Maine in 2003 (figure 4), with a payroll of \$103 million (figure 5). The number of employees is certainly low, according to state sources, which estimate the number to be over 8,000. The Census Bureau reports that the total value added for logging in 1997 was \$376.3 million and value of shipments was approximately \$1.02 billion (figure 5).

Figure 4. EMPLOYMENT IN FOREST-BASED MANUFACTURING, NEFA STATES



Sources: US Bureau of the Census, 1997 Economic Census (logging: New York, Vermont, New Hampshire); US Bureau of the Census, Annual Survey of Manufacturers, 2001 (other: New York, Vermont, New Hampshire), US Bureau of Economic Analysis (all sectors of Maine)

Figure 5. PAYROLL, VALUE-ADDED, AND VALUE OF SHIPMENTS FOR FOREST-BASED INDUSTRIES, NEFA REGION

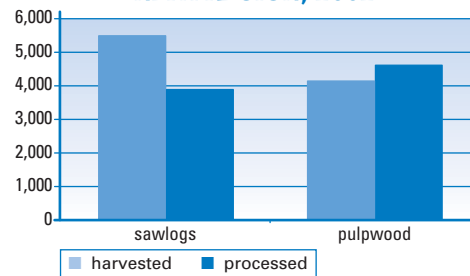


Sources: US Bureau of the Census, 1997 Economic Census (logging payroll: New York, Vermont, New Hampshire); US Bureau of Economic Analysis (logging payroll: Maine), US Bureau of the Census, Annual Survey of Manufacturers, 2001 (value-added, value of shipments: all states)

Production of Lumber and Related Solid Wood Products

Although the number of sawmills in the NEFA region has decreased in the last few decades, the remaining 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 the NEFA region processed 1,898 million board feet sawlogs into lumber (figure 6). The NEFA region's wholesale lumber companies consolidate lumber from many small sawmills throughout the northeast. The lumber is graded, kiln-dried, surfaced, and sorted for domestic and global markets.

Figure 6. SAWLOG AND PULPWOOD HARVESTED AND PROCESSED, NEFA REGION, 2002



Source: State Natural Resource Agencies

Wood chips used in the manufacture of pulp and paper come from sawmill residues and specialty chipping operations and are of higher quality than biomass chips. In 2002, four million cords of pulpwood were harvested from the NEFA region's forests. Over 4.6 million cords were processed in the region.

Census data for sawmills is included in Wood Products Manufacturing (NAICS 321). The sector also includes wood preservation, millwork, wood container and pallet manufacturing, prefabricated wood buildings, and other. In 2001, the Census Bureau reported that there were 16,789 individuals employed in this sector (figure 4), with a payroll of \$460 million in New York, Vermont, and New Hampshire (figure 5). The US Bureau of the Census, Bureau of Economic Analysis, reported that 6,654 individuals were employed in this sector in Maine in 2003 (figure 4), with a payroll of \$247 million (figure 5). The total value added for Wood Products Manufacturing in 2001 was \$1.2 billion and value of shipments was \$2.5 billion (figure 5).

Pulp and Paper Manufacturing

This sector is the largest manufacturing sector in the Maine economy. New Hampshire and New York also have several large plants that anchor the pulp and paper industry. Census data in this category (NAICS 322) includes pulp, paper, and paperboard mills and converted paper product manufacturing. In 2001, the Census Bureau reported that there were 26,709 individuals employed in this sector (figure 4), with a payroll of \$1.6 billion in New York, Vermont, and New Hampshire (figure 5). The US Bureau of the Census, Bureau of Economic Analysis, reported that 10,216 individuals were employed in this sector in Maine in 2003 (figure 4), with a payroll of \$638 million (figure 5). The total value added for paper manufacturing 2001 was \$4.8 billion and value of shipments was \$9.7 billion (figure 5).

Wood Energy

Wood provides 6% of electrical and heating needs in New Hampshire and Vermont, and about 24% in Maine. There are no figures available for New York. 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). 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 for 2002 totaled \$36.9 million. Sales of firewood for residential consumption have not been updated for several years in the NEFA region. For the years data is available, 1.6 million cords of firewood were harvested and processed in the NEFA region, contributing \$179 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 the NEFA region contributes to a growing secondary industry composed of 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 and related products — NAICS 337) includes wood kitchen cabinet and countertop manufacturing, non-upholstered wood household furniture manufacturing, and custom architectural woodwork and millwork manufacturing. In 2001, the Census Bureau reported that there were 21,572 individuals employed in this sector (figure 4), with a payroll of \$582 million in New York, Vermont, and New Hampshire (figure 5). The US Bureau of the Census, Bureau of Economic Analysis, reported that 1,793 individuals were employed in this sector in Maine in 2003 (figure 4), with a payroll of \$64 million (figure 5). The total value added for furniture and related products was \$1.4 billion and value of shipments was \$2.3 billion.

Associated Forest Products

In 2001 sales of maple products in the NEFA region totaled \$16.2 million. Sales of Christmas trees and wreaths totaled \$50 million. A small cottage industry dedicated to the harvesting of greens and ginseng exists, but there are no current data available to quantify the effort.

Gross State Product

Gross State Product (GSP) is a broad measure of economic activity corresponding to GNP at the national level. Forest-based manufacturing contributed \$5.5 billion to the NEFA region's GSP in 2003, which was 7.7% of the total manufacturing GSP (table 3).

TABLE 3. GROSS STATE PRODUCT, FOREST-BASED MANUFACTURING, NEFA REGION, 2003

Wood products manufacturing	\$1,191 million
Paper manufacturing	\$3,058 million
Furniture and related products	\$1,258 million
Total	\$5,510 million
Total GSP manufacturing	\$71,031 million

Forest-related Recreation and Tourism

Most recreation and tourism activities in the NEFA region 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.

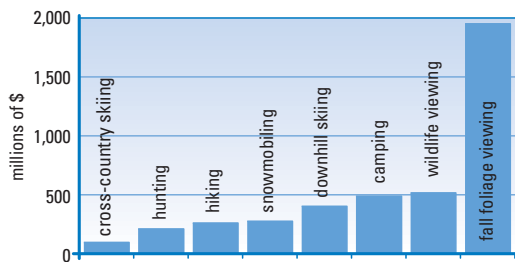
Estimates of number of visitor, or participant, days engaged in for each selected recreation activity were drawn from the National Survey on Recreation and the Environment (NSRE) and by updating data from the 2001 NEFA reports (these reports used 1997 data, which was the most current available). For 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 US 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 \$5 billion in sales to the economy of the NEFA region. The portion attributed to the forest resource is \$3.99 billion. 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 with wildlife viewing second (figure 7). About 43,500 people are directly employed with payrolls of \$645 million due to the forest-related recreation in the NEFA region.

Figure 7. FOREST-RELATED RECREATION AND TOURISM EXPENDITURES, NEFA REGION, 2001



Source: NEFA, 2004

Conclusion

The economic importance of the NEFA region's forests is significant. In a predominantly rural state, the forest provides important jobs and payroll for close to 90,000 people, and a significant source of income for forest landowners. The sale of forest products adds over \$15.5 billion to the region's economy. Additionally, the forest attracts millions of visitors to the region for recreation and tourism activities, contributing over \$3.9 billion. Altogether, the contribution of forest-based manufacturing and forest-related tourism and recreation to the NEFA region economy is over \$19.5 billion.

SOURCES OF DATA AND TEXT EXCERPTS

Canham, H. O., *Economic Impact from Forest-related Recreational Activities in the NEFA Region*, 2004. Report prepared for Northeast State Foresters Association (NEFA).

Department of Energy, Energy Information Agency, 2002 data.

Empire State Forest Products Association web page: www.esfpa.org.

Innovative Natural Resource Solutions LLC, 2004. *New Hampshire Bio-oil Opportunity Analysis*, Prepared for New Hampshire Office of Energy & Planning. <http://nh.gov/oep/programs/energy/documents/nhbio-oilopportunityanalysis.pdf>.

Innovative Natural Resource Solutions, LLC, March 2005. Maine Future Forest Economy Project, *Current Conditions and Factors Influencing the Future of Maine's Forest Products Industry*. Prepared for Maine Department of Conservation and Maine Technology Institute.

Maine Public Utilities Commission, 2002. Report and Recommendations on the Promotion of Renewable Resources, <http://mainegov-images.informe.org/mpuc/2004legislation/RPS%20Report-leg.pdf>.

Maine Forest Service, *2002 Wood Processor Report and 2002 Silvicultural Activities Report*.

National Survey on Recreation and the Environment (NSRE), *Outdoor recreation for 21st Century America, A report to the nation: the national survey on recreation and the environment*. Cordell, H.K. et al. 2004. Venture Publishing Inc. State College, PA.

New York Department of Environmental Conservation, *Industrial Roundwood and Consumption Report*, 2002.

New York Logger Training Program. www.nyloggertraining.org

New Hampshire Division of Forests and Lands, *2002 Report of Cut and 2002 Sawmill Survey*.

New Hampshire Governor's Office of Energy and Community Services, personal communication with Joe Broyles, Energy Program Manager, Dec. 2004.

New Hampshire-Vermont Christmas Tree Growers Association, personal communication with Executive Secretary John Horst, Dec. 2004. Website: www.nh-vtchristmastree.org.

Northeast State Foresters Association (NEFA), 2001. *The Economic Importance of the Northeast's Forests*. www.nefainfo.org.

U.S. Bureau of the Census, Manufacturing, Mining, and Construction Statistics, *Annual Survey of Manufacturers, Geographic Area Statistics, 2001* (Issued Jan. 2003.) <http://www.census.gov/prod/2003pubs/m01as-3.pdf>.

U.S. Bureau of the Census, 1997 Economic Census, Summary Statistics for New Hampshire, NAICS Basis, Manufacturing, NH (also for NY, VT, and ME) http://www.census.gov/epcd/ec97/nh/NH000_31.HTM

U.S. Bureau of the Census, 1997 Economic Census, Manufacturing Industry Series, Logging. <http://www.census.gov/prod/ec97/97m1133a.pdf>

U. S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts*, 2003. www.bea.doc.gov/bea/regional.

USDA, New England Agricultural Statistics Services, 2001.

U.S. Department of the Interior, 2004. *National Survey of Fishing, Hunting, and Wildlife-Related Activities*. USDI. Washington, DC.

USDA Forest Service, *Forest Inventory and Analysis* webpage, <http://fia.fa.fed.us>

Vermont Department of Forests, Parks, and Recreation, *Vermont Forest Resource Harvest Summary*, 2002.

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

CONTACT INFORMATION

Philip Bryce, Director
Division of Forests and Lands
NH Department of Resources and
Economic Development
PO Box 1856
Concord NH 03302-1856
603-271-2214 Phone
603-271-2629 Fax
pbryce@dred.state.nh.us

Alec Giffen, Director
Maine Forest Service
Maine Department of Conservation
State House Station 22
Augusta ME 04333
(207) 287-2791 Phone
(207) 287-8422 Fax
alec.giffen@state.me.us

Robert Davies, Director
Division of Lands & Forests
New York Department of
Environmental Conservation
625 Broadway
Albany NY 12233-4250
(518) 402-9405 Phone
(518) 402-9028 Fax
rkdavies@gw.dec.state.ny.us

Steve Sinclair,
Director, Division of Forests
Vermont Department of Forests,
Parks and Recreation
103 South Main Street, 10 South
Waterbury VT 05671-0601
(802) 241-3678 Phone
(802) 244-1481 Fax
ssinclair@fpr.anr.state.vt.us

Karen R. Mollander,
Planning and Information Coordinator
USDA Forest Service,
State and Private Forestry
271 Mast Road, PO Box 640
Durham NH 03824
603-868-7694 Phone
603-868-1066 Fax
kmollander@fs.fed.us

Charles A. Levesque,
Executive Director
NEFA
PO Box 2911
Concord NH 03302-2911
(603) 229-4965 Phone
(603) 226-0499 Fax
nefa@inrslc.com