# The Economic Importance of Vermont's Forests

## North East *State* Foresters Association

**DECEMBER 2004***

Forests dominate Vermont's landscape, covering over 78% of the state. Our forested ecosystem provides the basis for biological diversity, natural communities, scenic landscapes, and recreational opportunities. As a natural resource, forests provide an important economic base for employment, tourism, and recreation, and support a diverse forest products industry.

Because Vermonters use and value the forests in many ways, debate over the sustainability of our forests is spirited. I hope this report adds in your understanding of the wonderful resources of Vermont's forests, as it describes the economic contributions of forests to the state.

**STEVEN SINCLAIR,** Director, Division of Forests
Vermont Department of Forests, Parks and Recreation

*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 for those studies, 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 Vermont economy is over **$1.4 billion.**
- Forest-based manufacturing totaled **$1 billion in value of shipments** to Vermont's economy in 2001. This is 11% of the statewide value for manufacturing.
- Forest-related recreation and tourism expenditures contribute **$425 million** annually to Vermont's economy.
- The forest-based manufacturing economy provides employment for over 7,800 people and generates payrolls of **$216 million.** Forest-related recreation and tourism provides employment for 6,000 and generates payrolls of **$81 million.**
- Vermont landowners received estimated stumpage revenue in 2001 of **$30 million.**
- The annual sale of Christmas trees, wreaths, and maple syrup contributes approximately **$18.6 million.**
- Wood provides 6% of total energy use in Vermont. Revenues from sales of biomass chips totaled **$4.8 million** in 2002. Sales of cordwood generate **$27 million** annually.
- Each 1,000 acres of forestland in Vermont support 1.6 forest-related manufacturing jobs and .52 forest-based recreation and tourism jobs.

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

| | *Millions of $* | *$ per acre* |
|---|---|---|
| Forest-based manufacturing value of shipments | 995.6 | 216 |
| Forest-related recreation and tourism | 425.0 | 92 |
| Christmas trees/maple products | 18.6 | 4 |
| **Totals** | **1,439.2** | **312** |

# The Forest Resource in Vermont

Vermont's forested ecosystem provides the basis for biological diversity, natural communities, wildlife habitats, and scenic landscapes. The forests of Vermont also provide an important economic base for employment, tourism, and recreation, and support a diverse forest products industry.

## Land Area

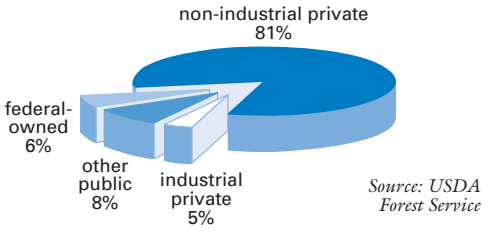
Vermont covers 5.9 million acres. Seventy-eight percent, or 4.6 million acres, is forested. Of these forested acres, 4.5 million acres (97%) are classified as timberland by the USDA Forest Service, or land that is fertile and accessible enough to produce wood as a crop and is not withdrawn from timber harvesting by statute or regulation (table 2).

**Table 2. TOTAL LAND AREA, FOREST LAND ACRES, AND TIMBERLAND ACRES, VERMONT, 1997**

| *Total land area* | *Forest land* | *Timberland* |
|---|---|---|
| 5,919,600 | 4,628,900 | 4,482,500 |

The majority of timberland in Vermont (3.5 million acres or 81%) is privately owned by non-industrial private owners. Industrial ownership is 5%, or 252,600 acres. State and federal government own 632,700 acres, or 14% of timberland (figure 1).

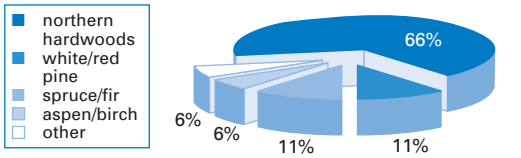
**Figure 1. TIMBERLAND OWNERSHIP, VERMONT, 1997**




*Source: USDA Forest Service*

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 Vermont (figure 2) and covers 3 million acres (66%), followed by the white/red pine, spruce/fir, and aspen/birch types.

**Figure 2. FOREST TYPES, VERMONT, 2002**




*Source: USDA Forest Service*

# Forest-based Manufacturing

The forest-based manufacturing system consists of timber harvesting, primary manufacturing, and secondary manufacturing. Vermont has an active and diversified primary and secondary wood processing industry that provides good markets for Vermont's wood and, because of the state's small size, results in extensive wood movements with nearby states. Forest-based manufacturing is widely dispersed throughout the state and provides important employment opportunities to many rural areas.

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 under-counts 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

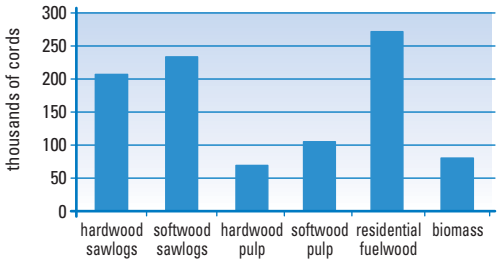
The conversion of roundwood, or parts of trees, into lumber, veneer, pulp, and paper starts with the primary manufacturing sectors. In Vermont, lumber and related solid wood products made in sawmills are the major primary processing activities. There is also a stable wood energy sector.

### *Timber Harvesting*

Most forest land in Vermont is privately owned by individual landowners who sell their standing trees as "stumpage." In 2002, estimated total sales of stumpage earned by Vermont landowners was $30 million.

Figure 3 provides data on the harvest of wood products in Vermont for the year 2002. During that year, 103 million board feet of hardwood sawlogs and 119.4 million board feet of softwood sawlogs were harvested from Vermont's forests, totaling 222.4 million board feet. Vermont's pulpwood harvest was 171,395 cords. The whole tree chip harvest totaled 199,228 green tons. These chips are used primarily as fuel in wood-to-energy facilities. They are also used in sludge composting, playground padding, and mulch.

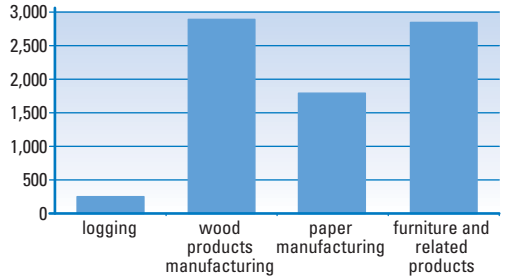
**Figure 3. FOREST RESOURCE HARVEST SUMMARY, VERMONT, 2002**




1,000 board feet = 2 cords
1 cord = 2.5 green tons

*Source: Vermont Department of Forests, Parks & Recreation*

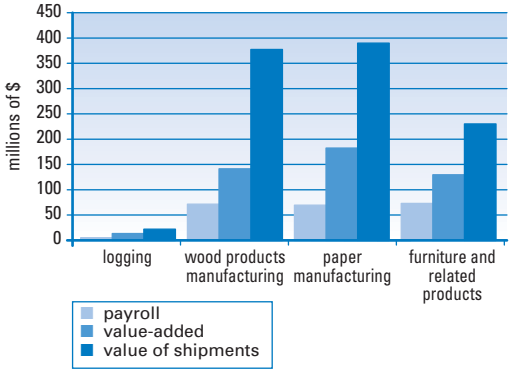
**Figure 4. EMPLOYMENT IN FOREST-BASED MANUFACTURING, VERMONT, 2001**




*Sources: US Bureau of the Census, 1997 Economic Census (logging); US Bureau of the Census, Annual Survey of Manufacturers, 2001 (other)*

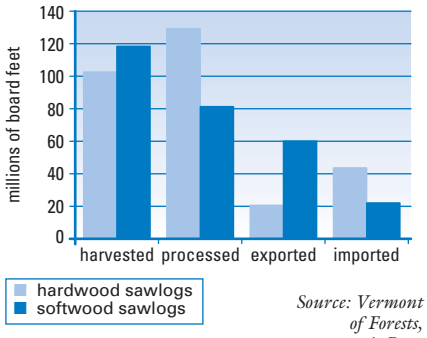
Timber harvesting includes tree felling, skidding timber to a roadside landing, processing timber into logs or bolts, and transporting the materials over roads to a primary manufacturing facility. The logging and log trucking industry is an important source of employment in northern Vermont, although this is not reflected in the federal data. Census data in this category (NAICS 113310 — Logging) includes cutting and transporting timber and has not been updated since the 1997 Economic Census. In Vermont in 1997, the Census Bureau counted 251 individuals employed in this sector (figure 4), with a payroll of $5.1 million. (Data from state sources estimate there are currently 400-500 timber harvesters.) The total value added for logging in 1997 was $13.4 million and the value of shipments was $22.0 million (figure 5).

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




*Sources: US Bureau of the Census, 1997 Economic Census (logging); US Bureau of the Census, Annual Survey of Manufacturers, 2001 (other)*

**Figure 6. SAWLOG HARVEST, PROCESS, EXPORT, IMPORT, VERMONT, 2002**




*Source: Vermont Dept. of Forests, Parks & Recreation*

## *Production of Lumber and Related Solid Wood Products*

In 2002, 185 sawmills in Vermont processed 126.3 million board feet of hardwood and 81.7 million board feet of softwood timber into lumber (figure 6). Twenty-three mills process over 86% of the wood. One hundred twelve mills process less than 10 thousand board feet/year or are idle. There are no pulp plants in Vermont, so the 170,000 cords harvested were exported to neighboring states.

Census data for sawmills is included in Wood Products Manufacturing (NAICS 321). This sector also includes wood preservation, millwork, wood container and pallet manufacturing, and prefabricated wood buildings. In Vermont in 2001, there were 2,920 individuals employed in this sector (figure 5), with a payroll of $73.3 million. The total value added for wood products manufacturing was $144.8 and the value of shipments was $374.5 million (figure 6).

## *Paper Manufacturing*

Census data in this category (Paper manufacturing — NAICS 322) includes Paper mills and Paperboard mills. In Vermont, in 2001, there were 1,816 individuals employed in this sector (figure 4), with a payroll of $66.3 million. The total value added for paper manufacturing was $183.7 million and the value of shipments was $390 million (figure 5).

### *Wood Energy*

Wood provides 6% of electrical and heating needs in Vermont. Dozens of industrial, public, and residential buildings consumed 276,000 tons of biomass fuel during 2002; 199,228 tons were harvested from Vermont's forests. Revenues from sales of biomass chips in 2002 totaled $4.8 million. Residential consumption of firewood in Vermont is estimated at 272,000 cords, valued at $27 million.

The demand for biomass has affected harvesting trends in Vermont. The increase in demand for pulpwood from Vermont, for hardwood pulp in the region, and continued whole-tree chipping for pulpwood and industrial fuelwood, has leveled out the percentages of low quality (44%) to high quality wood (56%) harvested.

## 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 Vermont contributes to a flourishing secondary industry, composed of several hundred dispersed companies that provide jobs and economic stability to mostly rural communities. Flooring, furniture, canoes, and woodenware are just a sample of items produced in these businesses. Vermont's secondary manufacturing industry is growing and the State Department of Economic Development estimates that the sector has the capacity to double in both employment and value of shipments.

### *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 Vermont, in 2001, there were 2,855 individuals employed in this sector (figure 4), with a payroll of $71.1 million. The total value added for furniture & related products was $134.1 million and the value of shipments was $231.1 million (figure 5).

## Associated Forest Products

Sales of maple products in 2001 totaled $8.6 million. Sales of Christmas trees totaled $10 million. Data were not available for Christmas wreaths. A small cottage industry dedicated to the harvesting of greens and ginseng exists, but there are no data available to quantify the effort.

## The Position of Forest-based Manufacturing in the Vermont Economy

Table 3 provides a comparison of the forest-based manufacturing sector with the total manufacturing sector in Vermont. Forest-based manufacturing employs 17% of manufacturing employees and provides 12% of the manufacturing payroll. This sector provides 9% of value added receipts in manufacturing and 11% of value of shipments receipts.

**Table 3. FOREST-BASED MANUFACTURING AND OTHER MANUFACTURING INDUSTRIES, VERMONT, 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 | 7,842 | 17% | 216,405 | 12% | 462,717 | 9% | 995,627 | 11% |
| All manufacturing | 45,847 | | 1,740,482 | | 5,077,917 | | 8,925,947 | |

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

# Forest-related Recreation and Tourism

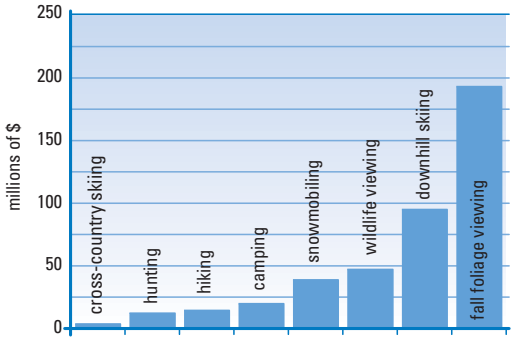
Most recreation and tourism activities in Vermont are linked to the forest, but it is difficult to estimate the contribution made by the forest environment towards recreation and tourism expenditures. The recreation activities selected for this report take place primarily in a forest environment and 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.

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 censes 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 $566 million in sales to the Vermont economy. The portion attributed to the forest resource is $425 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 accounts for almost half of the total sales, with downhill skiing second with almost 25%. Over 6,000 people are directly employed with payrolls of $81 million due to forest-related recreation in Vermont (figure 7).

**Figure 7. FOREST-RELATED RECREATION AND TOURISM EXPENDITURES, VERMONT, 2001**




*Source: NEFA, 2004*

# Conclusion

The economic importance of Vermont's forests is significant. In a predominantly rural state, the forest provides important jobs and payroll for over 13,000 people, and an important source of income for forest landowners. The sale of forest products adds $1 billion to the state's economy. Additionally, the forest attracts millions of visitors to the state for recreation and tourism activities, contributing $425 million. Altogether, the contribution of forest-based manufacturing and forest-related recreation and tourism to the Vermont economy is over $1.4 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.

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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@inrsllc.com