

# Vermont in Transition:

*A Summary of Social Economic and Environmental Trends*

A study by

**Center for Social Science Research at Saint Michael's College**

Vince Bolduc, Ph. D. and Herb Kessel, Ph. D.

for the

**Council on the Future of Vermont**

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## Chapter 7: FORESTRY



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# Chapter 7: FORESTRY

Vermont's extensive forestlands contribute in many important ways to the character and quality of life of the state, but can be easily taken for granted. More than three-quarters of Vermont's nearly six million acres of land are forested, nearly all of which is considered timberland, or commercially viable.<sup>1</sup> Within the U.S., only Maine (90%) and New Hampshire (85%) are more heavily forested.<sup>2</sup> Vermont's forests provide a vital, multiuse renewable resource for the state. According to the North East State Foresters Association, forest-based products and related sectors contributed just over \$1.5 billion dollars to the Vermont economy in 2005.<sup>3</sup> Vermont's forests also provided the state with 6% of its electricity and heating needs in 2005, including 275,000 cords of wood for heating homes and businesses.<sup>4</sup>

While it's easier to quantify the economic value of forests, the ecological services and social impacts may be even more important. Forests promote biological diversity, provide critical wildlife habitat, improve water quality, stabilize soil erosion, and remove carbon dioxide from the atmosphere replacing it with oxygen. Forest based recreational opportunities are also central to Vermont's allure to millions of tourists and residents alike, from fall foliage viewing and hiking to hunting and camping. The forestry industry also sustains communities by providing jobs and income mostly in the rural areas of the state.

<sup>1</sup> Timberland is forests that can produce at least 20 cubic feet per year per acre and are not withdrawn from harvesting activities because of statute or regulations.

<sup>2</sup> *Forest Resources of the United States, 20002*, "Table I-Land area in the United States by major class, region, subregion, and State, 2002." Smith, Miles, Vissage, and Pugh. U.S. Department of Agriculture, Forest Service. 2004

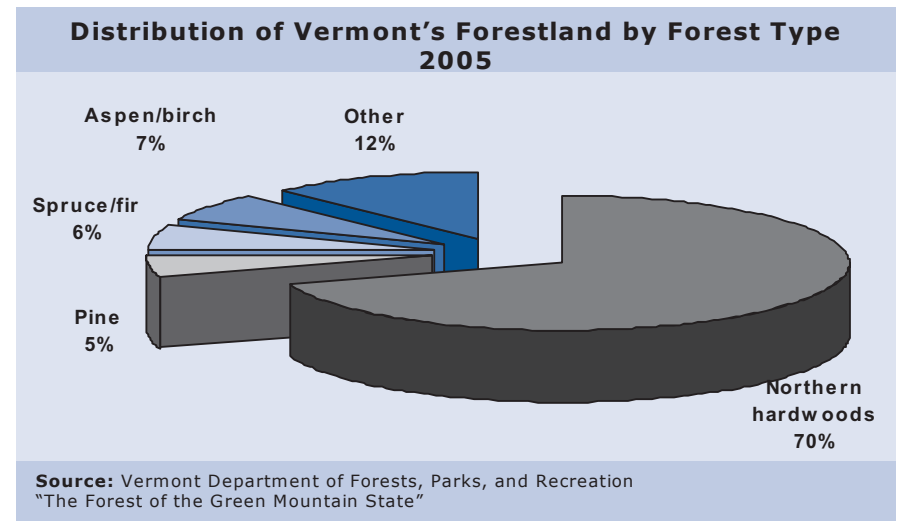
<sup>3</sup> North East State Foresters Association, "The Economic Importance of Vermont's Forests, 2007," August 2007. The figures cited do not include multipliers that are often used to account for the indirect or secondary expenditures associated with an area of interest, but \$1.5 billion does include forest based manufacturing, Christmas trees and maple products and forest-related tourism and recreation.

<sup>4</sup> Ibid

The types of forests found in Vermont vary depending on the particular soil depth, climate and terrain found in a region. Seventy percent of all of the state's forests are classified as Northern hardwoods, followed by White/Red Pine (5%) and Spruce/Fir (6%).<sup>5</sup> A diversity of trees, however, exists within any particular forest type. Over time, the distribution of forest types within the state has changed. Between 1983 and 2005, the percent of Northern hardwood forests has increased, while softwood forests have decreased.

Vermont forests contain a wide range of shrubs and trees, the majority of which are hardwoods. The ten most common trees in order include:<sup>6</sup>

- |                       |                   |                |
|-----------------------|-------------------|----------------|
| 1. Sugar Maple        | 5. Red Spruce     | 8. Balsam Fir  |
| 2. Red Maple          | 6. American Beech | 9. Paper Birch |
| 3. Eastern Hemlock    | 7. Yellow Birch   | 10. White Ash  |
| 4. Eastern White Pine |                   |                |



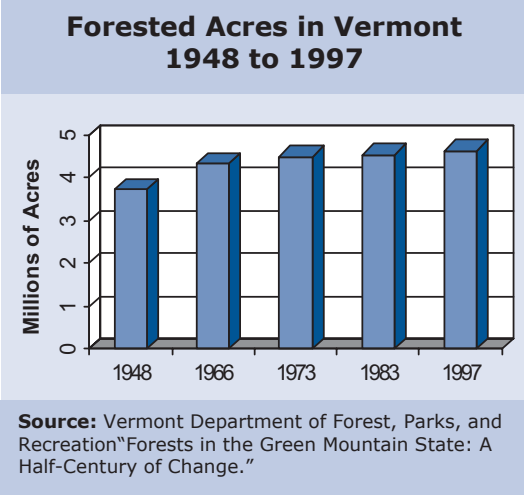
<sup>5</sup> USDA Forest Service, Vermont Department of Forests, Parks, and Recreation, "The Forests of the Green Mountain State."

<sup>6</sup> Vermont Forest Resources, 2006. U.S. Department of Agriculture. Forest Service.

# Trends in Vermont Forests

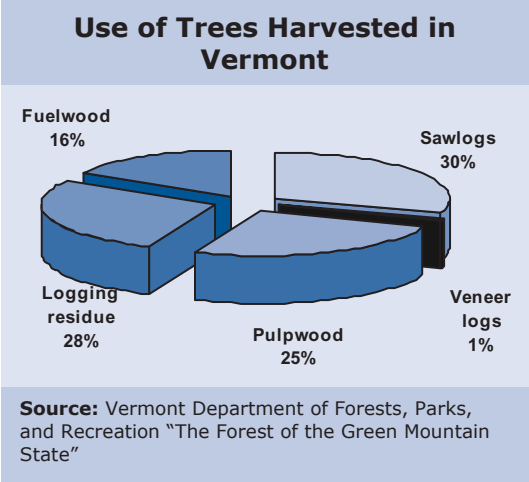
## Trend Number 1: Vermont has become more forested over the last half century.

Vermont has not always been as heavily forested as it is today. At the turn of the 19<sup>th</sup> century, forests were cleared for their timber and to make room for farming. As the number of small farms began to decline with the onset of the industrial revolution and the opening of America's West, pastures and abandoned fields turned back to forests. This process has not stopped; today, Vermont has 2% more forest area than it had in 1983 and 24% more than in 1948.<sup>11</sup>

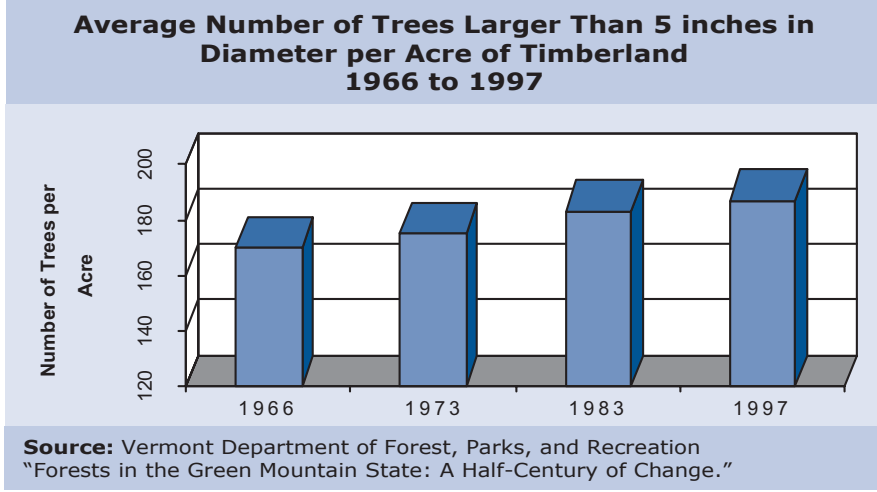


While the amount of land that is forested has expanded, the average size of trees and their crowns (i.e., the area of all the branches and leaves

Forests provide a number of commercial products. Just over one-half of the trees that are harvested each year in Vermont are sawlogs (timber that can be made into lumber) or veneer logs (high quality wood that can be peeled into thin veneers for multiple purposes). The logs are exported either to other states or to Canada. If milled in Vermont, the logs go to either one of two veneer plants, or one of the approximately 200 sawmills scattered throughout the state.<sup>7,8</sup> Pulpwood, accounting for one-quarter of the annual timber harvest, comes from lower value trees and the upper sections and branches of trees. The pulpwood is shipped to pulp mills in New York, Quebec and Maine, which, after processing, is used to produce paper at paper mills, some of which are in Vermont. Fuel wood (for either residential or commercial heating) accounts for another 16% of the harvest. Vermont has two large-scale wood energy plants, one in Burlington and the other in Ryegate, along with a number of smaller wood burning facilities. Households buy cordwood to burn in woodstoves and fireplaces. In 2003, wood supplied 3% of household heat, down gradually from 1979, a time when oil prices were rising.<sup>9</sup> News reports suggest that Vermonters are once again turning to wood as an important source of heating, especially with the introduction of newer more efficient wood pellet stoves.<sup>10</sup> The remaining wood that is harvested is left in the forests as residue.



<sup>7</sup> Vermont Agency of Natural Resources, Division of Forestry, [http://www.vtfpr.org/util\\_for\\_utilize\\_invt.cfm](http://www.vtfpr.org/util_for_utilize_invt.cfm)  
<sup>8</sup> There are also a number of portable sawmills in the state.  
<sup>9</sup> GDS Associates, Inc. "Final Report. Vermont Energy Efficiency Potential Study for Oil, Propane, Kerosene and Wood Fuels," January 16, 2007. Vermont Department of Public Services  
<sup>10</sup> "With Oil Prices Rising, Wood Makes a Comeback," Katie Zezima. New York Times. February 19th, 2008.



<sup>11</sup> Vermont Department of Forest, Parks, and Recreation "Forests in the Green Mountain State: A Half-Century of Change."

coming off the main tree trunk) has also been growing. The number of trees larger than 5 inches in diameter per acre of timberland for example has grown from 170 in 1966 to 187 in 1997.<sup>12</sup>

Each year, Vermont loses some of its forest areas to extreme weather events (ice storms, lightning, and wind), insects, disease, timber removal, residential and commercial development and normal mortality. This loss has been more than offset in Vermont with open fields turning back into forest areas, in part due to the yearly loss of dairy farms, and the expansion of existing forests. The net effect has been the slow growth of Vermont forest areas.

Information from the Vermont Department of Forest, Parks, and Recreation provides a more detailed view of the change in timberland over the last 50 years.<sup>13</sup> As Vermont's forests age and expand, mortality and timber harvests have been increasing, but the growth in forests has been able to more than offset mortality and harvesting.

*Trend Number 2: Vermont's forests, which are largely privately owned, are becoming more fragmented, making it harder to manage forests.*

Vermont's forests are largely privately owned by individuals and families (see Appendix, Chart 3-1). In 2006, only 19% of Vermont's forests were publicly owned, well under the national level of 29%, yet considerably higher than the 9.5% recorded in 1983.<sup>14</sup> Much of the new public

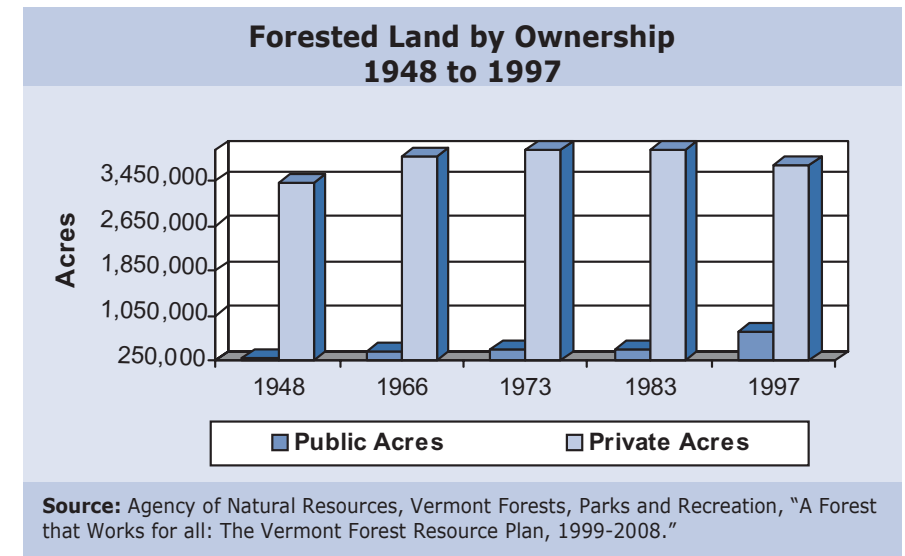
Average Annual Net Change of Growing-Stock Volume (Thousand Cubic Feet) on Timberland					
	1948	1966	1973	1983	1997
Gross growth	148,000	110,000	136,700	225,054	209,473
Mortality	(20,000)	(26,200)	(30,100)	(42,959)	(41,635)
Net growth	128,000	83,800	106,600	182,095	167,838
Removals	(54,736)	(48,346)	(35,406)	(57,019)	(93,554)
Net change	73,264	35,454	71,194	125,076	74,284

**Source:** Vermont Agency of Natural Resources, Vermont Forests, Parks and Recreation, "A Forest that Works for all: The Vermont Forest Resource Plan, 1999-2008."

forestland has been acquired by the State of Vermont rather than local governments or the federal government.

Private ownership of Vermont's forestland has led to fragmentation, a process where contiguous forests become separated by residential and commercial development, roads and other uses. In 1983, the U.S. forest services estimated there were

almost 62,000 private forest owners in the state. In 1993, the number of forest owners had risen to an estimated 80,500 owners.<sup>15</sup> Between 1983 and 1993, the number of private forest owners with less than 50 acres increased by over 40%.<sup>16</sup> From 1953 to 2002, the percentage of Vermont's



<sup>12</sup> Vermont Department of Forest, Parks, and Recreation "Forests in the Green Mountain State: A Half-Century of Change."

<sup>13</sup> Agency of Natural Resources, Vermont Forests, Parks and Recreation, "A Forest that Works for all: The Vermont Forest Resource Plan, 1999-2008." P. 33

<sup>14</sup> "Assessment Report: Key Indicators. The Vermont Forest Resource Plan: 1999-2008. A Forest that Works for All." Vermont Forests, Parks, and Recreation.

<sup>15</sup> "Forests in the Green Mountain State: A Half-Century of Change," Vermont Department of Forests, Parks, and Recreation.

<sup>16</sup> "Forest-Land Owners-1983," Widmann and Birch. U.S. Department of Agriculture. Forest Service "Forests in the Green Mountain State: A Half-Century of Change," Vermont Department of Forests, Parks, and Recreation.

forests owned by the forest industry, private owners with the largest tracts of land, dropped substantially from 14% to 5.6% (Appendix, Chart 3-2).<sup>17</sup> A 1993 study prepared by the United States Forest Service showed that the median woodlot size in Vermont was relatively small. In 1993, 52% of forest owners had less than 10 acres of land, comprising only 4% of all forest acreage. Parcelization, the breaking up larger lots into smaller lots, is also reflected in the numbers above. In concert, trends in fragmentation and parcelization impact the health of the State's forests, commercial productivity and wildlife corridors. With much of Vermont's forests privately owned, and many in small parcels as well, forest management and the monitoring of ecosystems has become more challenging.

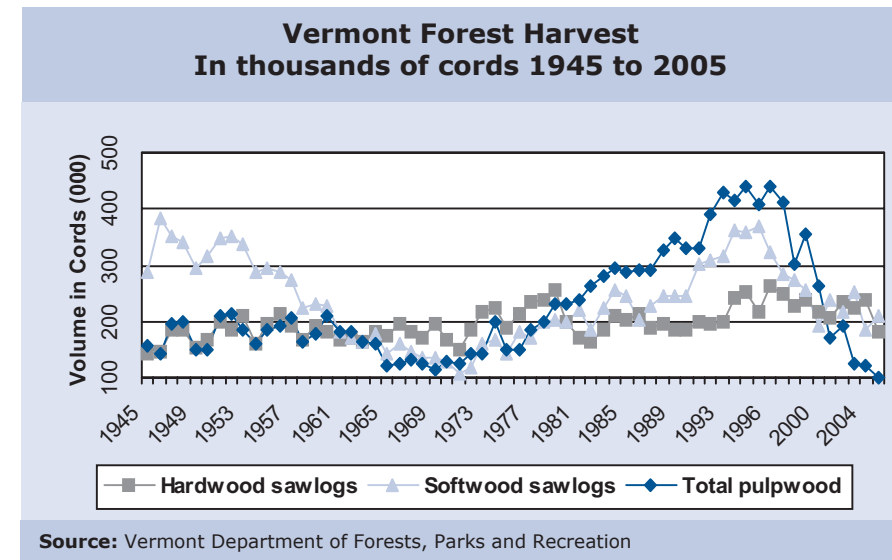
The State of Vermont enacted the Use Value Appraisal program (UVA) in 1978 to encourage landowners with at least 25 acres of forests to put into place long-term forest management plans.<sup>18</sup> The UVA allows landowners to have their property taxed at the current or forest use value, rather than fair market or development value.<sup>19</sup> The amount of land subject to UVA has grown considerably in the last 30 years. Today, approximately one-third of all private forestland (just over 1.5 million acres) is enrolled in this program (Appendix, Chart 3-3).<sup>20</sup> The UVA is discussed in more detail in Chapter 3, Land Use.

***Trend Number 3: Pulp and softwood harvests have declined considerably from the highs reached in the mid 1990's. Hardwood harvests shows only a very modest long-term positive trend, but year-to-year swings in output are more noticeable.***

The harvest of Vermont hardwoods fluctuates from year to year, but over a 50 year period, the total volume of output has risen slightly. In contrast,

the softwood and pulpwood harvests grew strongly from the early 1970's to the mid 1990's and thereafter fell substantially. Softwood harvests began to decline in the mid 1990's due to an oversupply, and then were constrained again with the onset of the long running U.S.-Canadian trade dispute over softwood pricing. In 2002, the U.S. put into place special tariffs against Canadian softwood, arguing that Canada was "dumping" or selling lumber in the U.S. at below the cost of production. Yet, Vermont's softwood, in particular spruce and fir, which were being milled in Quebec (Vermont lacks sawmills that process spruce and fir boards for construction purposes), became an unintended victim of this trade war. Without being able to export to the U.S., Canadian mills cut off their imports from Vermont. In 2006, NAFTA concluded that the U.S. tariffs were illegal. Future data may show an improvement in softwood harvests now that Canadian softwood exports are no longer subject to discriminatory tariffs.

Vermont lacks its own pulp mills. Traditionally, pulpwood from Vermont had been shipped to mills in Maine and New Hampshire for processing.<sup>21</sup> But with the closing of mills in these states and an increase in international pulp shipments, Vermont pulp harvests have declined.



<sup>17</sup> Forest Resources of the United States, 2002. Table 10, p. 52. U.S. Department of Agriculture, Forest Service.

<sup>18</sup> The current use program also covers agricultural land.

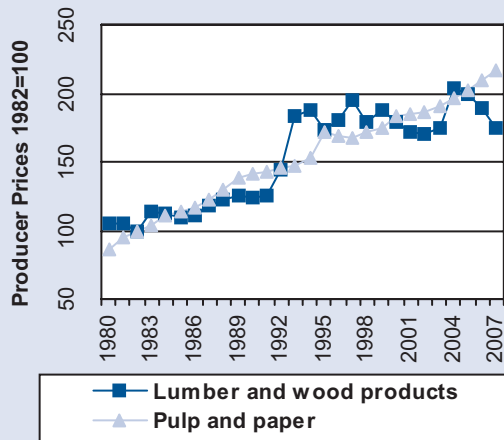
<sup>19</sup> To enroll land in the program, private property owners are required to develop and implement an approved forest management plan for their forestland. If successful, the program should improve overall stewardship of Vermont's private forests and help maintain contiguous blocks of private forests.

<sup>20</sup> Vermont Department of Taxes

<sup>21</sup> As noted earlier, pulpwood refers to wood used to make paper.

At the national level, wholesale prices for lumber, wood products, pulp and paper have been rising for over 25 years. While there is some volatility, especially in the wholesale prices of wood products and lumber, officials at the Vermont Department of Forests, Parks, and Recreation feel that the particular mix of Vermont's wood products has not experienced the same long-term price increases seen at the national level.

**National Producer Price Index for Lumber, Wood Products, Pulp and Paper (1982=100) 1980 to 2007**



Source: U.S. Department of Labor, Bureau of Labor Statistics

*Trend Number 4: The value added of the output produced from forestry and logging and wood product manufacturing has changed little in the last decade, while furniture manufacturing and paper production have both declined in Vermont.*

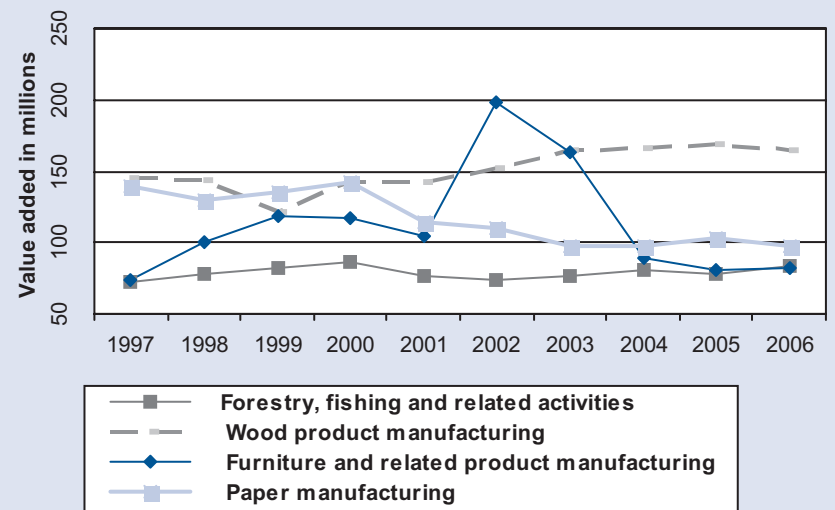
The forest industry in Vermont can be classified into four major sectors; forestry (including logging), paper manufacture, furniture manufacture and the manufacturing of other wood products.<sup>22</sup> Taken together, these sectors accounted for just over 1.8% of Vermont's total GDP in 2006, down from 2.8% in 1997.<sup>23</sup> The relative decline in the commercial value of the forest industry is not unique to Vermont, as similar declines have been recorded nationally. In 2006, 13% of the total value added in the Vermont

<sup>22</sup> Wood products include the value of output from sawmills such as lumber, millwork, prefabricated buildings, wood containers, and wood preservatives.

<sup>23</sup> U.S. Department of Commerce, Bureau of Economic Analysis.

manufacturing sector came from wood, furniture and paper production, a slight decline from the 15% recorded by the Bureau of Economic Analysis in 1997.<sup>24</sup> While these trends are national in scope, they are still disconcerting because: (1) after computer and electronics manufacturing, forest-related manufacturing sales in Vermont is the most important industry in this sector and (2) the jobs are in areas of the state that have few relatively higher paying positions.

**GDP for Forest and Wood Products Industries (Value added in millions) 1997 to 2006**



Source: U.S. Department of Commerce, Bureau of Economic Analysis

The Department of Commerce estimates that forestry, fishing and related activities produced \$84 million in value added output in 2006, higher than

<sup>24</sup> There are two major sources for revenues figures for the forest industry. Information from the U.S. Bureau of Economic Analysis provides value added statistics for the major sectors in the economy. Long-term trend data is limited due to the reclassification system put into effect in 2002, when SIC codes were replaced by NAICS codes. More detailed information is available from the U.S. Department of Commerce in its Economic Census that is conducted every five years. But like the information from the U.S. Bureau of Economic Analysis, the changing classification system limits trend data. The trends that can be derived from these two sources (although only two data points are available with the five year manufacturing census) are parallel.

the \$73 million recorded in 1997.<sup>25</sup> Over the last decade, the value added output from wood manufacturing has been slowly rising and reached \$165 million in 2006. In both cases, once inflation is taken into account, these modest gains become declines in sales. The two other forestry-related industries, furniture and paper manufacturing, have experienced reductions in value added output even without adjusting for inflation. The decline in paper production has been longer and more gradual, while furniture manufacturing fell sharply after 2002, reflecting the Ethan Allen Company's decision to close manufacturing plants in Island Pond in 2001 and in Randolph in 2002.

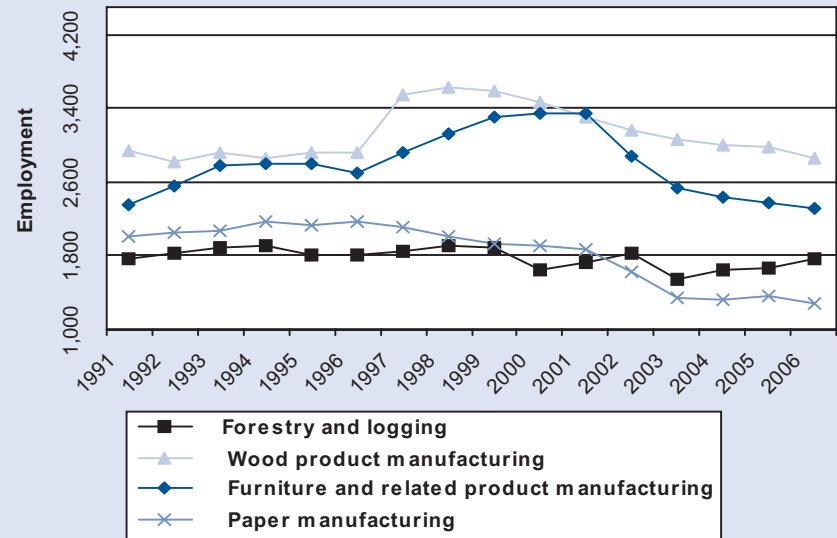
**Trend Number 5: Employment opportunities have declined over the last decade in the sectors related to forest production.**

Employment levels in logging and forestry vary considerably depending upon the sources used. The North East State Foresters Association estimates that Vermont had approximately 700 loggers and 110 private foresters in 2006. These estimates are considerably higher than the numbers provided by the Vermont Department of Labor (VDOL), but the state's employment statistics only include those in the covered sector, workers subject to the quarterly wage reporting system. As noted earlier, these estimates exclude the self-employed. The VDOL estimated that there were 382 covered employees working in the forest and logging industry in 1988 and only 169 in 2004. The U.S. Bureau of Economic Analysis, which stopped publishing estimates after 2000 because of disclosure problems, listed 1,639 employees in forestry and logging in 2000, down by 100 workers over the decade. The U.S. Census Bureau provides estimates of the number of establishments without paid employees, largely the self-employed, in broad industrial categories. In 1997, the U.S. Census Bureau identified 1,407 of these workers, falling to 1,282 by 2006. While the numbers in each case differ, employment in logging and forestry is trending downward.

The employment situation in the other forestry-related sectors has fared no better in recent years than in logging and forestry. For example, employment in furniture manufacturing has declined from 3,341 jobs in

2001 to 2,320 in 2006 (a third of these job losses can be traced to the closing of Ethan Allen's plants).<sup>26</sup> Paper manufacturing has lost just over 900 jobs between 1996 and 2006. The manufacture of wood products, which experienced a slight increase in value added sales, has also seen a decline in employment with almost 800 jobs lost between 1998 and 2006.

**Full and Part Time Employment in Vermont's Forest and Wood Industry 1991 to 2006\***



**Source:** U.S. Department of Commerce, Bureau of Economic Analysis  
 \* The Bureau of Economic Analysis stopped providing employment statistics for forestry and logging after 2000, but employment figures for the broader category, forestry, fishing, and related activities are available from 1991 to 2006. Forestry and logging employment estimates after 2000 were calculated based upon the assumption that the ratio between forestry and logging and forestry, fishing, and related activities between 1991 and 2000 would remain constant and therefore could be used to estimate employment levels from 2001 to 2006 for the narrower category, forestry and logging.

<sup>25</sup> The U.S. Bureau of Economic Analysis does not provide separate figures for forestry, but only as part of the broader category of forestry, fishing and related activities.

<sup>26</sup> U.S. Department of Commerce, Bureau of Economic Analysis.

Vermont's furniture manufacturing sector can be classified in a three-tiered system:

- (1) The Ethan Allen furniture company.
- (2) A small group of well-known, upscale specialty furniture and related product manufacturers.
- (3) A larger group of self-employed, small-scale furniture and related product makers.

While Ethan Allen furniture has had cutbacks, it still employed 900 furniture workers in Vermont in 2006, or almost 40% of the state's total workers in this sector.<sup>27</sup> Ethan Allen is the dominant furniture manufacturer in Vermont, and as such, it might mask other trends that are emerging in the industry. According to the U.S. Department of Commerce, in 2002, Vermont had 93 furniture manufacturers with 3,111 employees and sales of over \$405 million.<sup>28</sup> Most of the 93 firms were relatively small entrepreneurial furniture manufacturers. Companies like Lyndon Furniture, Vermont Furniture Design, Pompanoosuc Mills, Shackleton Thomas Furniture, Vermont Folk Rocker, and Copeland Furniture are high-end producers and rely extensively on local hardwoods and marketing their Vermont connections. Lastly, the state also has a large number of self-employed furniture makers and producers of various wood related products. In 2002, 122 self-employed furniture and related product makers generated sales of \$4,267,000 or an average of almost \$35,000 per person. By 2006, the number had grown to 140 with sales of \$5,442,000, for an average of almost \$39,000.

In the long run, creating a brand identity may provide some protection for Vermont furniture manufacturers from low cost global producers. But the unanswered question is whether the state's numerous small producers, along with Ethan Allen, can expand on the existing network of commercial forestry operations to sustain the industry in the long run?

According to the Vermont Forests, Parks and Recreation, Vermont forests are healthy: "Current forest statistics describe a forest that is increasing in acreage, number of trees, annual growth, volume, and maturity, and

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<sup>27</sup> "New Power Plants Helps Ethan Allen Factory," Carla Occaso, Times Argus Newspaper, July 14, 2006.

<sup>28</sup> U.S. Department of Commerce, 2002 Economic Census of Manufacturing.

exhibits improved overall health."<sup>29</sup> On the economic front, Vermont's forest industry faces significant challenges, many of which are similar to the ones faced in agriculture. These include heightened international competition, high energy and insurance costs, labor shortages, and finding markets for the specialized products manufactured by Vermont's relatively small-scale producers.

The major trends in Vermont's forestry industry include:

1. Vermont has become more heavily forested over the last half century.
2. Vermont's forests, which are largely privately owned, are becoming more fragmented, making it harder to manage forests.
3. Pulp and Softwood harvests have declined considerably from the highs reached in the mid 1990's. Hardwood harvests show only modest increases over the last 50 years, but large year-to-year swings in output are noticeable.
4. The value added of the output produced from forestry, logging and wood product manufacturing has changed little in the last decade, while furniture manufacturing and paper production have both declined.
5. Employment opportunities have declined over the last decade in the sectors related to forest production.

**For the appendices and for pdf versions of this report, please visit the Council on the Future of Vermont's website; [www.futureofvermont.org](http://www.futureofvermont.org) or visit Vermont Council on Rural Development at [www.vtrural.org](http://www.vtrural.org).**

**The Appendix for this chapter contains the following charts:**

1. Distribution of Ownership of Vermont's Forests, 2006.
2. Forest Company Ownership of Vermont Forests, % Acres, 1953 to 2002.
3. Use Value Appraisal Program, Acres Enrolled in Forest Land, 1980 to 2006.
4. Sawtimber in Vermont's Forests, 1973 to 1997

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<sup>29</sup> Agency of Natural Resources, Vermont Forests, Parks and Recreation, "A Forest that Works for all: The Vermont Forest Resource Plan, 1999-2008." P. 6





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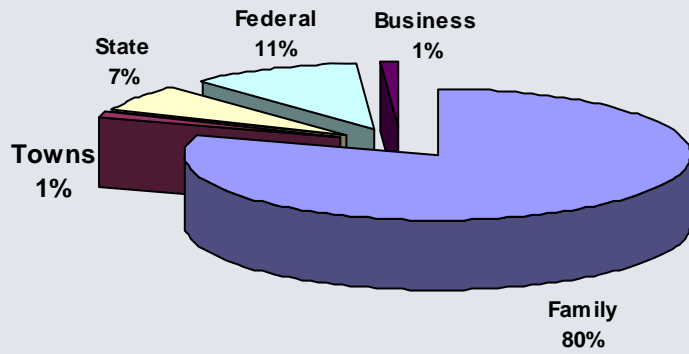
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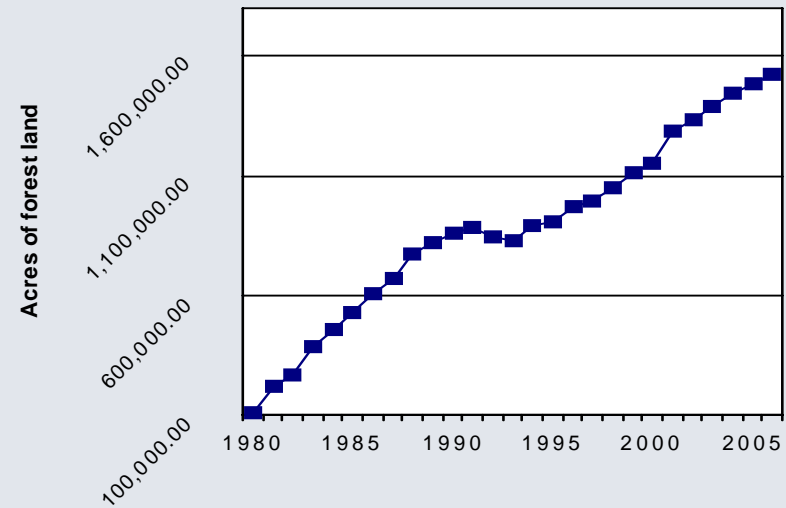
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**Chart 7-1  
Distribution of Ownership of Vermont's Forests  
2006**



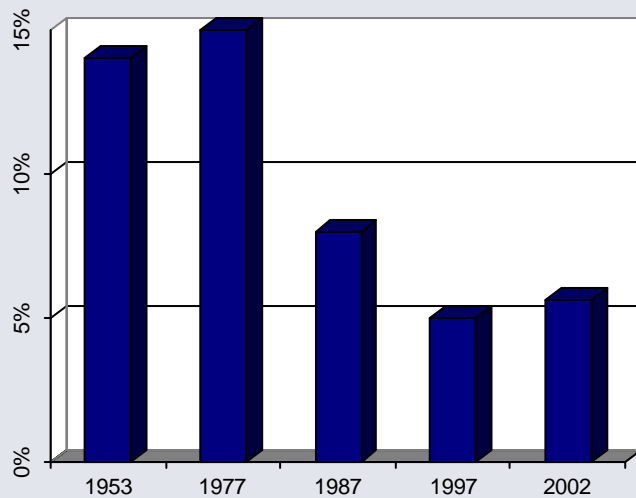
Source: U.S. Department Agriculture Forest Service, "The Forests of the Green Mountain State."

**Chart 7-3: Use Value Appraisal Program  
Acres Enrolled in Forest Land  
1980 to 2006**



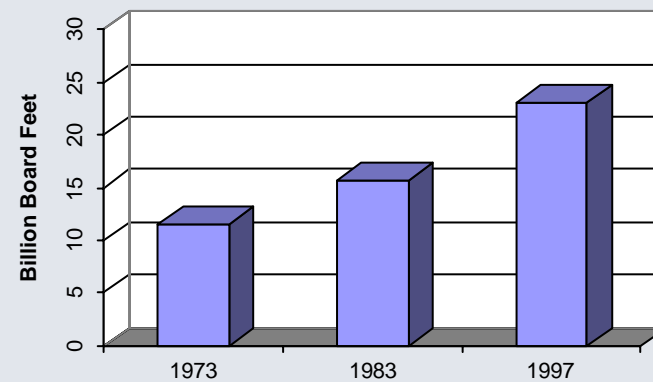
Source: Vermont Department of Taxes

**Chart 7-2  
Forest Company Ownership of Vermont Forests  
% Acres  
1953 to 2002**



Source: Forest Resources of the United States, 2002  
U.S. Department of Agriculture, Forest Service

**Chart 7-4  
Sawtimber in Vermont's Forests  
1973 to 1997**



Source: U.S. Department Agriculture Forest Service, "The Forests of the Green Mountain State." Wharton et. al.