MAINE

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NORTHEASTERN
FOREST
ALLIANCE

THE ECONOMIC IMPORTANCE OF MAINE'S FOREST

1991

INTRODUCTION

The Northeastern Forest Alliance (NEFA) was formed in 1986. Its major goal is to promote the Northeast forest and its related products on a regional basis. The Alliance also hopes to increase public awareness of the value of forest resources to the four-state region and to give local, state, and federal policymakers whose decisions affect forest resources information to help them better understand the impact of their decisions.

To accomplish these objectives, NEFA commissioned a "Regional Economic Profile" research project. Preliminary research was conducted by the Irland Group, a forestry economics consulting firm in Augusta, Maine, assisted by Professor Hugh O. Canham of the New York State College of Environmental Science and Forestry at Syracuse, and Dr. Wil Richard of the University of Waterloo, Ontario. Using this data as a starting point, additional information was compiled by Rick Cooksey, a University of New Hampshire graduate student working for the USDA Forest Service. Also included is information from each state's utilization and marketing records, and research done by the Northern Forest Lands Council's Local Forest Based Economy Subcommittee.

NEFA's original objective in doing this study was to produce a regionwide report. Problems with incompatability of state to state data made this impossible.

To overcome this problem, NEFA chose to develop individual state summary reports for each of the NEFA states (ME, NH, VT and NY), rather than an all-encompassing regional report. Each summary report documents the importance of each state's forest to its economy. It provides estimates of the employment and spending generated in the state by wood products processing and by forest-related tourism. It also offers estimates of public revenues associated with these activities and details the costs of major state programs addressing forest resources.

In this report, the economic importance of the forest sector is measured, where possible, by employment and payroll generated directly in the wood and forest recreation sectors. All data is for 1989, the most recent year for Bureau of Census data.

Federal data sometimes differs from state estimates. Differences can be caused by different sampling, enumeration, or estimation procedures; different treatment of proprietors and uncovered employment; and sampling errors. It is well known that both federal and state data undercount part-time and seasonal meals and lodging employment as well. Because of these difficulties with the data, minor inconsistencies appear between tables. These inconsistencies do not affect the overall validity of this report. In all cases, assumptions, data, and methods were designed to yield accurate minimum estimates.

The study's scope did not include evaluating the forest's direct and important values in water supply, wildlife observation, regional open space, and other uses, so the estimated economic impacts shown here are in fact conservative.

This document is a summary report of the original Regional Economic Profile. It is intended to provide specific information about the Northeast forest's value to the state of Maine, in laymen's terms. For additional detailed information about the sources, methodology, and analysis used to obtain the figures presented in this report, contact NEFA.

The Northeastern Forest Alliance (NEFA), was created in August, 1986 by the Natural Resources Commissioners from Maine, New Hampshire, New York and Vermont. The four-state Alliance's major goals are to promote the Northeast forest and its related products on a regional basis, and to increase public awareness of the value of forest resources.

EXECUTIVE SUMMARY – MAINE HIGHLIGHTS

Forest-related activities in Maine cover a wide variety of activities. The forest-based economy — recreation and manufacturing — provides employment for over **50,300 people** and generates payrolls of over **$888 million**. In addition, wood plays a significant role in the region's energy mix.

In 1987, wood-based manufacturing alone contributed **$1.6 billion** in Gross State Product to Maine, or 8% of the Gross State Product. Shipments of products attributable to wood were **$4.6 billion** in 1987.

Of the four states in the NEFA region, the relative importance of forest-based economic activity is highest in Maine and Vermont, accounting for **12% of Maine's employment** and **11% of the state's payroll**.

Maine is the only NEFA state where estimated employment in forest-based recreation **(24,600 jobs)** does not exceed employment in forest-based manufacturing **(25,740 jobs)**. In Maine, forest-based manufacturing payrolls **($665 million)** exceed the payrolls for the forest-based recreation sector **($223 million)**.

The economic composition of forest-based manufacturing differs markedly from state to state within the NEFA region. The paper industry is the largest in value-added and total sales in each state but clearly dominates the Maine industry.

Sales of stumpage, roundwood, and lumber from sawmills are very important to Maine's rural economy. Maine landowners received estimated stumpage revenues in 1989 of **$129.6 million**. Total delivered value of these roundwood products for Maine was **$469.3 million**.

The wood harvested differs markedly from state to state. In Maine, softwood dominates sawlogs and pulpwood.

Wood energy also makes an important contribution to the state's economy. In 1985, wood energy accounted for **1,450** direct jobs and **$36.8 million** in direct income.

On a conservative basis, state general revenues from forest-based tourism and manufacturing in Maine are estimated at about **$39.8 million**. Recreation revenues amount to more than half of this amount due to the large revenues generated by state taxes on meals and lodging. Property taxes are not included in these estimates.

In Maine, total state government spending on forestry programs is **$8.7 million**, the majority of which is spent on fire protection and suppression, which is only .43% of the state's total general fund expenditures.

Considered on a per acre basis, the direct economic impact of Maine's forest is impressive:

Manufacturing Shipments	**$ 260/acre**
Gross State Product	**$ 90/acre**
Manufacturing Payroll	**$ 34/acre**
Value of Delivered Roundwood	**$ 26/acre**
Tourism Spending	**$ 97/acre**

Maine's direct employment based on the forest is also significant. On average in Maine, each thousand acres of forest land supports:

Forest Manufacturing Jobs:	**1.4 per 1,000 acres**
Forest Tourism Jobs:	**1.5 per 1,000 acres**
Total Jobs:	**2.9 per 1,000 acres**

THE FOREST RESOURCE IN MAINE

Forests throughout the NEFA region are extremely valuable. They support a wood-using industry vital to continuing the economic viability of rural and urban economies and provide the necessary backdrop and environment for a host of non-timber forest activities ranging from hunting, fishing, and viewing fall foliage, to camping and water storage and use.

The four states of the NEFA region share a similar pattern of climate, soils, and forest vegetation. In addition, the wood products utilization patterns and land use patterns in these states are roughly similar. These forests in the NEFA region include a diversity of species which contribute both to their economic value as well as their natural beauty.

Ownership

MAINE, with some **17 million** acres of timberland, is the most heavily forested state in the country. (See Table 1). Virtually all of the commercial timberland **(96%)** is privately owned; Maine has the highest percentage of industrially owned timberland **(48.2%)** in the U.S. (See Table 2).

TABLE 1
Maine's Total Land Area and Timberland Area, 1987
(Thousands of Acres)

Total Land Area	Forest Acres	Timberland Acres
19,732	17,713	17,175

DEFINITIONS: Timberland is forest land producing or capable of producing crops of wood (more than 20 cu. ft./acre per year) and not withdrawn from timber utilization by statute.

TABLE 2
Maine Timberland Ownership

Ownership Class	Area (Acres)	%
Forest Industry	8,286,000	48.2%
Non-industrial Private	8,275,000	48.1%
State	567,000	3.3%
Federal	46,000	.3%
TOTAL	*17,175,000	99.9%

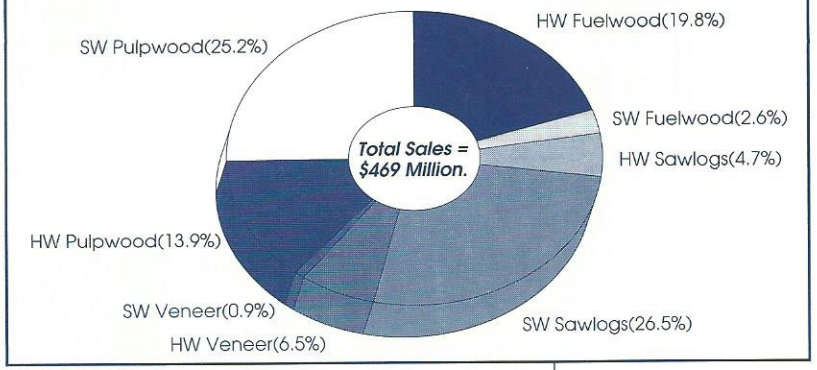
* Total forest land area is different from Table I since it excludes two sub-categories of land: (1) Reserved timberland (including Baxter State Park, 201,493 acres); and (2) Other forest land (small amounts).

DEFINITIONS: Reserved timberland is forest land that would otherwise be classified as timberland except that it is withdrawn from timber utilization by statute or administrative regulation. Other forest land includes available and reserved unproductive forest land, which is incapable of producing annually 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions, such as sterile soils, dry climate, poor drainage, high elevation, steepness, or rockiness.

Stumpage and Delivered Roundwood Sales

"Stumpage" is the money earned by landowners for the sale of their standing timber. In 1987, the total sales of stumpage earned by Maine landowners was **$129.6 million**. Sales of delivered roundwood products to mills or homeowners totalled **$469.3 million** (Figure 1). In Maine, large quantities of wood are sold on a contract basis directly to mills, rather than as stumpage, which is not included in this report.

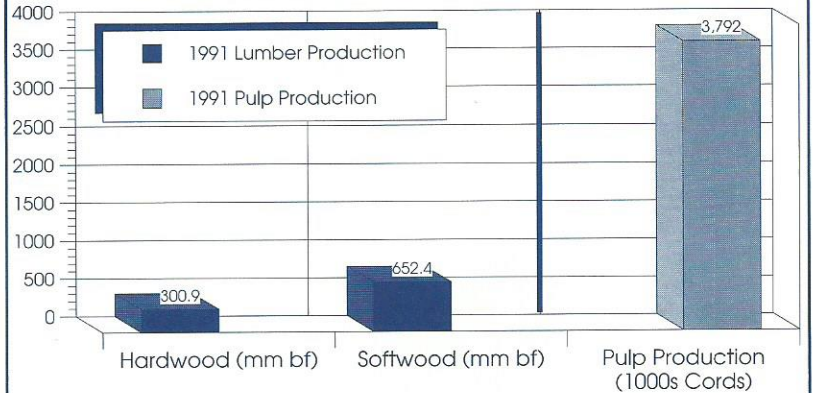
(FIG. 1)
MAINE SALES OF DELIVERED ROUNDWOOD PRODUCTS, 1987 ($)



Lumber and Pulp Production

In 1991, Maine industries processed **300.9 million board feet of hardwood lumber** and **652.4 million board feet of softwood lumber**. The most recent figures for pulp production (1991) show that Maine processed **3.792 million cords of pulpwood**. (Figure 2).

(FIG. 2)
MAINE LUMBER & PULP PRODUCTION, 1991



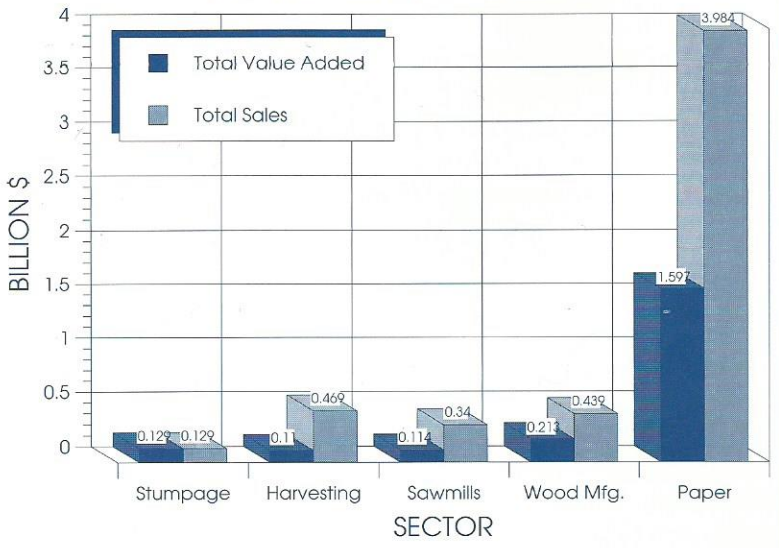
Sources: 1991 Woodprocessor Report, including Import/Export Info. Maine Forest Service, Dept. of Conservation (Pulp: Widmann, R. 1992. Pulpwood Production in the Northeast 1990. USDA Forest Service. Resource Bulletin NE-123.)

FOREST-BASED MANUFACTURING

Forest industries are divided into two groups - "primary" and "secondary" manufacturers. Primary manufacturers convert the raw material into lumber, veneer, pulp and paper. Secondary manufacturers then convert these products into pallets, furniture, fine coated papers, cartons, flooring and other wood products.

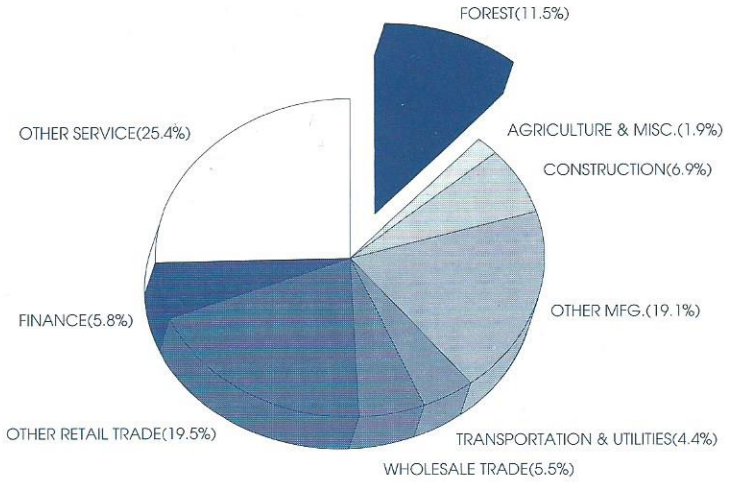
Information is given for value added and total sales by wood industry (Figure 3); employment by sector (Figure 4); and sales of delivered roundwood products (Figure 1).

(FIG. 3)
MAINE WOOD USES, 1989
Total Value Added and Total Sales



Total Value Added = $2.2 Billion.
Total Sales = $5.4 Billion.

(FIG. 4)
MAINE EMPLOYMENT BY SECTOR, 1989
Forest = Wood (all) + recreation



Gross State Product

Gross State Product (GSP) is a broad measure of economic activity corresponding to GNP at the national level. Nationally, all of the forest-based manufacturing sectors grew faster than all manufacturing did by this measure. This was true for all states except for paper in Maine. In all states, the share of forest-based manufacturing in GSP is far higher than for the US (which averaged 1.7%), except for New York.

Wood-based manufacturing contributed **$1.6 billion** to Maine's GSP in 1987, which was **8%** of the state's total GSP.

Manufacturing Shipments

In Maine, shipments of furniture, paper, and lumber totalled **$4.6 billion** in 1987 for all forest-based manufacturing shipments. This amounted to **43%** of all manufacturing shipments for the state.

The proportions of statewide economic activity due to the forest resource appear to be modest. But, this is not the entire story. Many communities depend heavily on seasonal forest-based tourism. Likewise, wood processing and paper are critical to the economic base of many communities in the region. In 1972, wood-based manufacturing accounted for **69% of all manufacturing jobs in Western Maine** (Irland, 1982). In 1990, the Northern Forest Lands Study, which covered the most heavily forested portions of the four NEFA states, estimated that the total direct, indirect, and induced employment based on forest industry was **15% of the total**.

Forest-Based Manufacturing

This sector is divided into the following parts: stumpage, timber harvesting (SIC 241); sawmills (SIC 242); millwork (SIC 243); wood containers (SIC 244); wood buildings (SIC 245); miscellaneous wood products (SIC 249); furniture and fixtures (SIC 25); pulp and paper (SIC 26). Some of these have significant inputs of non-wood materials.

Employment and payroll in timber harvesting are significant but very difficult to obtain. Data used in this report comes from County Business Reports (US Census, 1989) but this is almost certainly an underestimate.

An estimate for the total economic impact of sales and payroll generated is **$5.3 billion**.

Sawmills

Employment and payroll are taken directly from County Business Patterns (US Census, 1989) for SIC sector 242. Estimates of value added and total sales are developed by updating data presented in the 1982 Census of Manufacturers. The update was developed by calculating value added, or total sales, in 1982 as a percent of 1982 reported payroll and applying that same percent to 1989 reported payroll. (This assumes that payroll, other costs, and product prices have changed in similar ways over the intervening seven years.)

The total value added for sawmills in 1989 was **$114 million** and total sales were **$340 million** (Figure 3).

Wood Manufacturing

The remaining sectors in SIC 24 (243, 244, 245, 249) and SIC 25 (furniture) were grouped together. Employment and payroll were taken from County Business Patterns and estimates of value added and sales were developed similar to that for sawmills. The furniture industry (SIC 25) contains many sectors other than wood furniture, yet for the NEFA region, most furniture manufacturing is wood-based.

The total value added for wood manufacturing in 1989 was **$213 million** and total sales were **$439 million** (Figure 3).

Paper

Paper is a very large, diverse industry in the northeastern United States. However, reliable statistics on just the wood pulp and paper manufacturing sectors are not available, even in Census data. This is primarily due to disclosure rules necessary for the small number of firms in any one state. However, based on the examination of data available, wood pulp and paper manufacturing dominates the industry.

The total value added for paper in 1989 was almost **$1.6 billion** and total sales were almost **$4 billion** (Figure 3).

Wood Energy

Although consistent information on wood energy consumption and prices is not available, a partial picture can be pieced together from state sources.

Wood pulp and biomass fuel regularly move across state and regional boundaries in amounts that vary by season and from year to year. USDA Forest Service bulletins which identify cross-state movements for major products don't provide current figures.

Rising energy prices and a new awareness of the benefits of energy production from local, renewable sources have prompted an increase in the use of wood energy. Paper mills and wood products plants have long relied on wood residues and bark for much of their energy needs. In rural areas of the region, wood stoves never completely disappeared. But since the first oil price shocks of the early 1970's, wood has assumed an important place in the region's energy mix. A 1992 study of the NEFA region estimates that roughly 30 to 40% of rural households rely primarily on wood for household heat.

According to information from the Maine State Planning Office, an estimated **700,000 cords** of wood are burned yearly in Maine households, and **1,360,000 cords** are burned by Maine industries. In 1989, the Maine Office of Energy Resources estimated that 1 out of every 3 Maine homes relied on wood as their primary source of fuel.

Wood-based energy production is intensively developed in Maine. Twenty biomass fuelled plants consumed **2.3 million tons** of whole tree chips and **1.65 million tons** of

mill residues in 1990 in addition to other fuels. The following economic impacts are associated with Maine's ten "stand-alone" plants:

- 280 year-round jobs;
- $73 million annual fuel and supply outlays; and
- 3,500 jobs supported statewide

Biomass fuels, mostly wood, accounted for 17.7% of Maine's electric generating capacity in 1990.

The wood fiber and bark burned for energy in the region comes largely from mill wastes, land-clearing waste, and from tops and low quality stems. Whole tree chips are important fuel sources throughout the region.

Generating energy from wood, therefore, brings a number of benefits, including reduced reliance on imported oil; reduced flow of dollars out of the country; decentralized energy production with lower transmission losses and higher reliability; consumer savings during periods of high oil prices; and local economic development and tax base improvement.

In 1986, a Conference of New England Governors (CONEG) report estimated the following economic impacts of wood energy for 1985 (Table 3).

TABLE 3
Economic Impacts of Wood Energy in Maine, 1985

		Fuel Displaced	
Direct # of Jobs	Direct Income (Millions of $)	Oil (MM Gal.)	Electric (MM Kwh)
1,450	$36.8	236	1,676

Employment/Payroll

The total number of manufacturing jobs directly attributable to Maine's forest was **24,600** in 1989, accounting for **$665 million** in payroll (Table 4). When including all employment in furniture, lumber and paper industries, those figures increased to **32,500 jobs** and **$920.5 million** in payroll.

TABLE 4
Maine Total and Forest-Based Manufacturing Employment and Payrolls, 1989

	Employment	Payroll
Activity Attributed to Forest-based Wood/Paper Mfg.	24,600	$665.2 million
Total Activity	32,500	$920.5 million

Associated Forest Products

In addition to the wood products Maine's forest generates, the forest also supplies other products. Based on 1991 data compiled from industry associations and the state's department of agriculture, the following figures were obtained.

Maple syrup – 112,000 gallons of syrup valued at **$1.87 million** were produced in Maine.

Christmas trees – 300 growers produced 300,000 trees for a value of **$5.25 million**.

Wreaths – 1 to 1.4 million wreaths, valued at **$6 million** were produced.

Economic Multipliers and Their Importance

Economic multipliers calculate the ripple effect that is caused by a change in spending behavior in a regional economy. Most of today's multipliers are based on input-output analysis, which describes the flow of money through a region's economy, as well as into and out of that region. For example, if a forest products manufacturer increases its sales by $1 to customers outside the region, the model would calculate how that new money moves to other industries and landowners who supply the manufacturer's raw materials, to the households who work for the manufacturer and all other businesses in the area that sell goods and services to the other industries and households. Multipliers are calculated on an industry basis, even though the entire set of transactions includes the multitude of other industries in the economy.

There are two types of multipliers: indirect and induced. **Indirect multipliers** consider only the business transaction side of input-output analysis when tracing the effect of new spending. **Induced multipliers** consider both the business and household sides of the analysis. They describe the total of all spending within the region's economy that resulted from the original increase in spending. Usually the induced multiplier has a value between 1.5 to 3 times as high as the indirect multiplier for the particular industry.

Where there are strong linkages within a region's forest products industry, multipliers can be much higher than for

other forms of manufacturing. This is because wood products manufacturers (other than paper companies) usually pay a larger share of each sales dollar to the household sector as payroll, which in turn goes through the local economy in the form of household purchases. However, multipliers will be low in the forest products industries if raw logs are immediately shipped out of the area for further processing. Where wood is harvested and processed locally into secondary wood products, such as dimension lumber, the multipliers for the wood harvesting sector can reach induced multipliers of over 5. This is very high, as most industries usually have induced multipliers between 2 and 4 in most rural areas. Wood products manufacturers such as furniture companies, paper mills and sawmills usually have induced multipliers in this range, with paper mills having the lowest multipliers.

MULTIPLE USE VALUE

Maine's forest provides economic benefits that are vital to the state's total economy. Employment and payroll, the sale of wood products, and biomass (wood energy) production all contribute to the state's economic well-being. Yet just as important as these economic figures is the role played by Maine's forest in terms of its recreation opportunities and environmental value.

Most recreation, tourism activities and industries are tied directly to our forests. The money generated from these activities accounts for billions of additional dollars to the economy of the four NEFA states.

From an environmental standpoint, Maine's forest also performs a critical role by collecting, cleaning, regulating and recycling the water we drink and the air we breathe. The forest is crucial to many watersheds, which form wetlands for wildlife and irrigate farmland. And although Maine is not a heavily populated state, urban residents enjoy tree-lined streets, parks and wooded subdivisions.

Although it is not possible to quantify all of the benefits of Maine's forest in economic terms, it is possible to assign value to recreation and tourism activities tied to the forest.

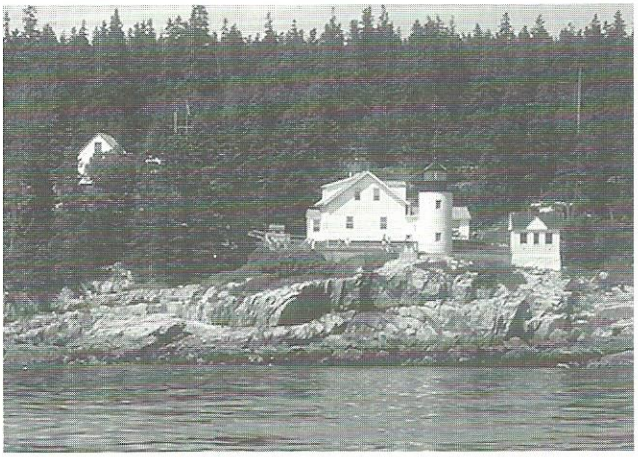
Based on information provided by the USDA Forest Service, the estimates shown in Table 5 can be considered as the value (on a per person per activity day) that people place on the forest resource for each particular use. These represent another dimension of the economic value of forests.

TABLE 5
Cost Per Activity Day

Camping, picnicking, swimming	$13.40
Travel to view scenery	3.13
Hiking, horseback riding, water travel	8.92
Winter sports	33.69
Wilderness	35.86
Nonconsumptive wildlife use	19.65
Hunting	38.22

Source: USDA Forest Service.

The differences between activities reflect the fact that people typically do not spend all day (10 hours) in some activities. For example, a picnic averages three hours in length whereas wilderness use may be a total 24-hour period. In addition, certain activities are valued by people not just for their direct use but also for the "option" and "existence" values, that is, people place a value on knowing that forests will be available should they wish to have the option of using them in the future, and are willing to pay to preserve the forests' existence.



FOREST-BASED RECREATION AND TOURISM EXPENDITURES

Forest recreation consists of many different activities, some of which actively use the forest, such as camping, and others which use the forest as a backdrop, such as driving for pleasure. Unlike wood manufacturing, no separate data is reported for recreation or tourism in Bureau of the Census reports.

There are further limitations on available demand data which compromise consistency and comparability. Demand measures actual participation in activities. With outdoor-based activities, often without control points, points of entry and other methods such as user fees, demand is often difficult to measure. There is not an annual nationally-mandated demand survey of participation in outdoor recreation — forest-based or otherwise.

Based upon a 1991 study "Economic Impact of Tourist Expenditures in Maine" conducted by Davidson-Peterson Associates, Inc., Maine received total forest-based travel expenditures in 1990 of **$1.713 billion** (Table 6).

TABLE 6
Maine Forest-Based Travel Expenditures, 1990
(Millions $)

Total Tourist Expenditures	% Forest-Based*	Expenditures Associated with Forest
$2,750	62.3%	$1,713.3

* Allocated to forest-base on the basis of employment.
Source: 1991. Davidson-Peterson Associates Inc. "Economic Impact of Tourist Expenditures in ME".

Employment and Payrolls

Recreation and tourism activities provide significant contributions to Maine's economy. The figures in Table 7 represent those that can be reasonably attributed to forest-based recreation, recognizing that there are other reasons why people come to the state. The figures for total payroll and employment based on recreation are measured using only hotels and motels and eating and drinking establishments.

TABLE 7
Maine's Total and Forest-Based Recreation Employment and Payrolls, 1989

	Employment	Payrolls
Total Activity	37,100	$321 million
Activity Attributed Forest-based Recreation	25,740	$223.1 million

Specific Recreational Activities

The following information comes from studies conducted in the Northeast in the mid- to late 1980's. The activities described are used to convey more specifically the economic magnitude of recreational activity.

Skiing

Alpine skiing is the most intensive recreational use of forest land in terms of people per acre per day. Its appeal is closely related to its forest setting. The four-state NEFA region contains an estimated 218 facilities for downhill skiing.

According to a study conducted for the Maine State Development Office (May, 1987), in the 1986/87 season, the average winter party from outside of Maine spent $359 per trip. Of this population, about one-third were downhill skiers. Winter travelers, on average, spend 3.1 nights in Maine with an average travel party size of 3.5. This works out to $33.08 per skier day, a conservative figure but the only one available. According to the Ski Maine Association, Maine records more than 1.1 million skier days per season.

Maine's ski industry in the 1985/86 ski season employed 700 full-time employees and 580 part-time employees to produce 566,000 thousand skier days. Assuming a constant ratio in time and space, the regional total of 10 million skier days would translate into direct employment of about 12,000 full-time employees and 10,000 part-time employees. According to the Ski Maine Association (1990), 25% of the expenditures of alpine facilities go into payrolls.

An estimated 200 cross-country skiing facilities are located in the four NEFA states. Based on a national survey, each facility, on average, experiences 7,500 skier days, and has about $93,100 in annual revenues. Of gross spending of $18.6 million, $15 million represents overhead—almost half ($6.8 million) being local labor costs. According to the same survey, each cross-country facility employees 5 full-time employees and 5 part-time employees. For 200 establishments, total employment (direct and indirect) is estimated to be 1,600 full-time jobs and 1,600 part-time jobs.

Snowmobiling

In a recent survey of snowmobilers in Canada, with a sample of 431 returned questionnaires, it was found that the average snowmobiler annually spends an average of $4,653 (Canadian) on snowmobiling. Of this amount, 74% is spent on equipment, i.e., machines, clothing, trailers. The other 26% is spent on "variables", i.e., food, lodging, gasoline, etc. There is no reason to suspect that snowmobile expenditures are dramatically different across the border in the U.S.; if anything they are likely to be higher, given greater disposable income.

Maine and New Hampshire have snowmobile gas taxes which generate a total of over $600,000 per year. Applying the Canadian snowmobile expenditure ratio to regional participation yields an estimate of better than **$200 million** of spending in this activity, perhaps best treated as an upper limit. In Maine, 57,000 snowmobiles were registered in 1990.

Family Camping

In Maine, **2.25 million** visitors use the state park system every year. An additional **5 million** either camped or visited other forested areas. The great majority of these visits were to Acadia National Park, the nation's second most visited national park.

Fall Tourism

In a study of Maine's Fall 1986 advertising campaign (Maine State Development Office, March 1987), it was concluded that 37% of the inquiries who requested state information on the fall season came to view the state's foliage. The average fall travel party spent $523 per visit. It is estimated that the 1986 fall foliage campaign introduced **$3.2 million** into Maine and directly supported between 62 and 175 full-time equivalent jobs.

Hunting and Fishing

Hunting in the northeastern United States depends mainly on a forest environment. Most hunting effort and expenditure in the Northeast is for big game, principally white tail deer, black bear and moose. Much of the economic impact of hunting therefore occurs because of, and can be directly attributed to, the forest.

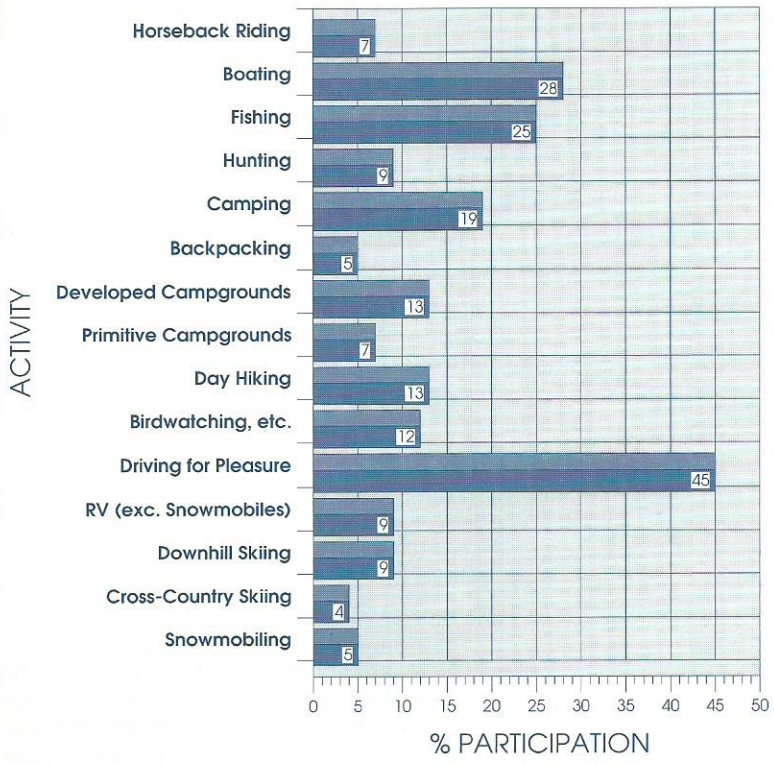
Much of the forest-related economic impact of hunting relates to trip-related expenditures; monies spent for travel, food, and lodging. The 1985 National Survey of Fishing, Hunting, and Wildlife Associated Recreation (US Dept. of Interior, 1988) estimates that **$30.285 million** was spent by hunters in Maine. Expenditures have been extensively studied in Maine. In 1988, there were almost 215,000 licensed resident freshwater fishermen and almost 100,000 licensed non-resident freshwater fishermen in Maine. Average annual expenditures per angler were found to be $258 for residents and $308 for non-residents. This translates to **$45.5 million** for residents and **$29 million** for non-residents.

Hunting was also surveyed and measured for economic impact. In 1988, there were almost 183,000 licensed resident hunters and somewhat over 39,000 licensed non-resident hunters. Average annual expenditures by hunters were $158 for residents and $282 for non-residents. This translates to **$24.9 million** for resident hunters and **$10.8 million** for non-residents. Hunting and fishing, then, contributed a total of **$110.2 million** to the Maine economy in 1988.

(FIG. 5)

Activity Participation in Forest-Related Activities, 1982-83.

Northeastern Region (pop. 12 and older)



Source: USDI, National Park Service. 1982-1983. Nationwide Recreation Survey. April, 1986. p. 22.

Forest Recreation Participation Rates

The previous chart (Figure 5) lists the percentage of participation in various forest-based recreation activities in the Northeast, from the most recent national information available. This survey includes the entire Northeast, not just NEFA states. Water-oriented activities are included because so many occur in forest settings.

Multiplier Effect

The recreation industry can also have relatively high induced multipliers in rural areas. Again, the recreation industry starts with the situation of household labor receiving a larger than average share of that first dollar spent by the tourist, as the recreation industry is labor intensive. However, the industry's multiplier will be even higher if local tourist-based businesses use local contractors to build new facilities, purchase their supplies from local wholesalers and business service companies, and use local financial institutions. Eating and drinking places will have the highest induced multipliers, followed by amusements and attractions, the lodging industry, and finally tourist-oriented retail stores. Retail stores which specialize in the sale of products made by local craftspeople can have high multipliers, however. In rural areas the induced multipliers for most tourist-based spending is between 2 and 4.

Estimated Recreation Use by Activity and Person Days

The one most outstanding and comprehensive recreational use data set which is available by each state is the Statewide Comprehensive Outdoor Recreation Planning Process (SCORP). In compliance with federal requirements, it is filed every five years with the National Park Service. Of the four NEFA states, only two—Maine and New York—contain recreational demand (use) data which provide for some degree of regional aggregation and comparison; the other two states address supply (see Table 8).

In a survey conducted by the Maine Department of Conservation (1988) many recreationists reported that access to land had significantly diminished in recent years.

TABLE 8
Estimated Recreational Use
Maine, New Hampshire, Vermont, New York by Activity and Person Days – 1985
(in thousands)

ACTIVITY	STATE				
	Maine*	New Hampshire	Vermont**	New York***	Total
Freshwater Swimming	991			5,177	6,168
Freshwater Fishing	6,737			4,832	11,569
Hunting	3,278			N/K	3,278
Family Camping	2,142	600	1,850	4,270	8,862
Primitive Camping/Backpacking	754			1,143	1,897
Day Hiking/Nature Walks	1,380			11,313	12,693
Picnicking	2,386			N/K	2,386
Boating (motorized)	105****			3,711	3,816
Boating (canoe, sail, kayak, row)	525			5,731	6,256
Ski (alpine)	828	178	4,500	2,501	7,829
Ski (nordic)	246		240*****	2,180	2,700
Snowmobiling	312	34		1,230	1,576
Trail Biking	122			1,079	1,201
Ice Fishing	N/K			635	635

* Excludes south coast, central coast, and central Maine.
** Vermont ski and camp figures = 1989/90.
*** Statewide, only figures available.
**** Number of registered pleasure boats with motors.
***** Vermont's cross-country days are based only on skiing at commercial establishments where a trail fee is paid. Use of other trails has not been studied.

Sources: State SCORP's and other miscellaneous studies.

Note: Skier days vary widely from year to year.

FOREST-BASED STATE EXPENDITURES AND REVENUES

Total state spending on forestry programs is roughly **$8.7 million** for Maine. Forestry spending includes programs for fire control, land management, management assistance, and a variety of other forestry programs. This expenditure was below one half of one percent **(.43%) of total government outlays**. In addition, spending on forestry programs is below one percent of the value added attributed to timber, the ratio being highest in Maine.

General Revenues

Revenues from forest-based manufacturing and recreation are not reported in state revenue or other statistics. We have developed a set of rough minimum estimates for several major categories of state government revenues. Federal revenues are not considered. Also, major items like fuel taxes are not considered because these revenues only offset costs generated by motor vehicles, and are not available for general fund uses. Our intent has been to develop a minimum estimate of general fund state revenues arising from these activities. Multiplier effects are not considered for this reason. On this basis, we estimate that Maine's annual general revenues from forest-based recreation and manufacturing would be **$39.8 million** (Table 9).

TABLE 9
Maine's Estimated Tax Revenues from Forest-related Activities, 1987

Recreation Revenues	(Millions of $)
Room & Meals Tax	$8.5
Employee Income Tax	1.6
Employee Sales Tax	1.2
Business Income Tax	1.0
Subtotal Recreation	$12.3
Manufacturing Revenues	(Millions of $)
Employee Income Tax	$9.0
Employee Sales Tax	3.1
Business Income Tax	15.4
Subtotal Manufacturing	$27.5
TOTAL REVENUES	**$39.8**

Source: USDC Bureau of the Census, State Government Tax Collections in 1987.

We have not prepared estimates of property tax revenues based on forest land. Land uses are not always separated well in tax data, and the state tax systems for timberland vary widely. Property tax revenues are generally realized by the region's local governments.

Revenues From Federal Sources

Forest resource-based programs are also a significant source of federal funds for state agencies. We assembled data on revenues from forest-based activities from the National Association of State Foresters, Census documents, and state agencies. Maine's revenues from federal sources in 1987 totalled **$387,000**. These funds included revenue sharing from federal lands (mostly to counties) and federal forestry assistance programs to the states administered by the USDA Forest Service and other USDA agencies.

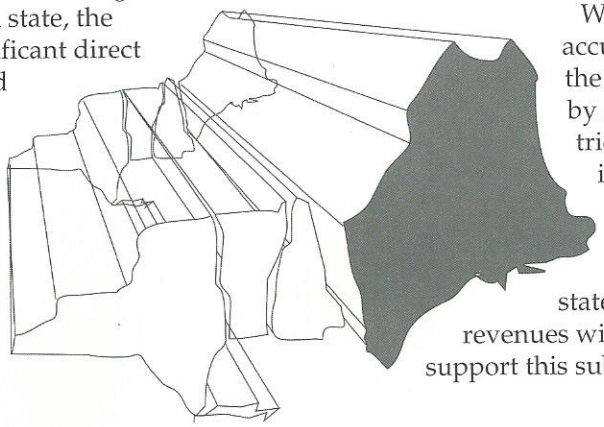
State Revenues

We did not include property tax revenues (usually local) due to lack of data and the lack of even a credible indirect estimation method. This means that timberland, recreation businesses, mills, and second homes are not reflected in terms of property tax revenues.

In some states, rules of thumb have been developed as aids to revenue estimation. In Maine in the 1980's for example, it was estimated that about 6% of personal income became state general fund revenue.

CONCLUSION

The economic importance of Maine's forest cannot be stressed enough. In a predominantly rural state, the forest provides significant direct and indirect jobs and payrolls for thousands of Maine people. The forest products that are produced add billions of dollars to the state's economy. Additionally, the forest attracts millions of visitors to the state for recreation and tourism activities.



While no report could accurately capture all the revenues generated by forest-related industries and activities, it is hoped that this report will showcase the forest's value and that state and federal revenues will continue to support this substantial resource.

CONTRIBUTION OF THE FOREST RESOURCE TO MAINE'S ECONOMY

	In Millions
Payroll/Employment	$888.3 (50,300 jobs)
Stumpage	129.6
Firewood	42.9
Manufacturing	4,594.5
Wood Fuel	36.8
Subtotal	$5,692.1
Tourism and Recreation (forest-based travel expenditures)	$1,713.3
Christmas Trees/Maple Syrup/Horticulture	13.1
Subtotal	$1,726.4
TOTAL EXCEEDS	**$7,418.5**

NOTE: The above chart is very conservative in that it does not include the economic benefits for the following categories:

- **transportation** (payrolls and support services for transporting wood products;
- **the construction industry,** which depends on wood products;
- **marketing** (payrolls and support services expended for marketing wood products).

Although these figures would certainly be significant, no information was presently available to quantify the economic benefit.

SOURCES INCLUDE: U.S. Dept. of Commerce, Bureau of the Census, 1987 Census of Manufacturers; Maine Census of Manufacturers, Maine Dept. of Labor; Davidson-Peterson Associates, Inc. "Economic Impact of Tourist Expenditures in Maine", 1991; Maine Christmas Tree Growers Association.

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