Does the Timber Experiences in Maine Hold Information for Other Regions?

William G. Luppold¹
Paul E. Sendak¹

Abstract

The abundant timber resources of Maine are crucial to the State's timber economy. So when the 1995 forest inventory revealed a 20-percent decline in softwood growing stock, there was great concern by both industry and government officials. The decline was the result of high mortality of spruce and fir due to a spruce budworm outbreak and a continued high rate of roundwood removals of these species. Further, forecasts show growing-stock levels declining in the near term. The continued high utilization rate for softwood growing stock was facilitated largely by continued low prices for softwood timber due to an increase in supply provided by salvage and presalvage cutting and continued high prices for softwood dimension lumber. When the price of dimension lumber remained relatively high in the mid 1990s, new sawmill technology adopted by Canadians allowed smaller diameter logs once used by the pulp industry to be processed into dimension lumber. As spruce-fir pulpwood became more expensive, hardwood pulpwood was substituted. A recent, partial forest survey of Maine indicated that inventories of spruce-fir growing stock have stabilized following the regeneration of these species that began after the initial spruce-budworm outbreak in the late 1970s. The decline in Maine's timber base during the 1980s and 1990s – an anticipated future decline – may have important implications for other eastern states.

Key Words: Timber-decline, Maine, Hardwood-substitution.

¹ Research Forester, Northeastern Research Station, 271 Mast Road, Durham, NH 03824
Does the Timber Experiences in Maine Hold Information for Other Regions?

Introduction

Maine is the most heavily forested state in the country (Powell et al. 1994) and has an extensive and diverse forest products industry. Therefore, it was of great concern when the viability of this valuable resource was threatened when the spruce budworm outbreak in the late 1970s and early 1980s reduced inventories of economically important spruce and fir species (Irland et al. 1988). Those concerns were validated when the 1995 forest survey of Maine revealed a 42-percent decline in spruce-fir growing stock since 1971 (Ferguson and Kingsley 1972; Griffith and Alerich 1996). This decrease resulted only from high mortality of spruce-fir species along with a relatively high harvest rate harvest for these species.

The current and potential decline in Maine’s softwood growing stock in general and spruce-fir growing stock in particular has been investigated intensively in New England (Irland et al. 1988; Seymour and Lemin 1989; Gadzik et al. 1998, Turner and Caldwell 2001). These researchers relied on forest-survey data (growing-stock inventory, removals, growth, mortality) compiled by the USDA Forest Service augmented with information from other sources, including data on forest products manufacturing and prices generated by the Maine Forest Service. All of these studies predicted declines in spruce-fir and subsequently softwood growing stock followed by increases due to regeneration. A preliminary analysis of a partially completed (40 percent) inventory of Maine’s forests revealed a slight increase in the volume of spruce-fir growing stock since 1995 (Griffith and Laustsen 2001). Such an increase was expected, though it may be occurring earlier than anticipated.

In addition to predicting declines in softwood growing stock, Seymour and Lemin (1989) expressed concern about the sustainability of hardwood inventories. The range of findings developed from timber supply studies points out the complexity of issues surrounding forest sustainability relative to forest health and the demand for forest products. Examining the interaction between the forest and markets in Maine might provide some additional insight. This approach also might be useful when examining what may occur in other eastern states as their growing-stock inventories of commercially important species decline due to of biological and/or market forces. In this study we examined changes in the structure and focusing of Maine’s forest resource by concentrating on the interaction between the market and inventory of growing stock.

Data considerations

Forest-inventory data were obtained from the 1959, 1971, 1982, and 1995 forest surveys of Maine (Ferguson and Longwood 1960; Ferguson and Kingsley 1972; Powell and Dickson 1984; Griffith and Alerich 1996). Each survey estimated growing-stock volume by species for the specific survey year. Forest surveys also provide estimates of annual removals (which are primarily timber harvests); however, timber removal data for Maine are questionable for earlier survey periods and differ from the Maine Forest Service’s consumption data.

We obtained data on softwood and hardwood sawtimber and pulpwood harvests reported by the Maine Forest Service from 1950 to 1999. Stumpage prices of sawtimber and pulpwood for
Maine were developed from price data reported by the Maine Forest Service from 1961 to 1992, and from 1993 to 2000 (Maine Forest Service 1961-92, 1993-2000). To contrast pulp and sawtimber markets, production volumes are reported in cubic feet and stumpage prices are reported in dollars per thousand cubic feet. It should be noted that the terms sawtimber and pulpwood consumption describe end-use and not the diameter of the material. For instance, lower grade hardwood sawtimber may be used as pulpwood while small diameter spruce-fir growing stock may be used to produce lumber. Because of the cyclical nature of forest products markets and the 12 to 14 year intervals between surveys, production and price data were examined as 6-year annual averages.

Changes in forest composition: 1959 To 1965

Maine’s growing stock inventories increased and the composition of the state’s forests changed between 1959 and 1995 (Table 1). Historically, softwoods have been predominant in Maine with spruce-fir (primarily red spruce with smaller volumes of black and white and balsam fir) the most dominant species group. Spruce-fir growing stock was highest during the 1971 forest survey but declined to pre-1959 levels by 1995 in both absolute and relative terms. Pines (primarily white) are the second largest component of Maine’s growing stock. The proportional volume of pine declined from 1959 to 1971 but has since increased. Hardwood growing stock also declined proportionally between 1959 and 1971 and then increased.

Maine’s roundwood markets

Four aggregate markets for Maine growing stock are: softwood sawlogs, hardwood sawlogs, softwood pulpwood, and hardwood pulpwood. Spruce-fir sawlogs are used to produce dimension lumber for building construction (framing). As dimension lumber, spruce-fir is a substitute for Douglas-fir, southern yellow pine, and other softwood dimension species. Although 60 percent of the spruce-fir harvested in Maine is processed in the State, 40 percent was exported (primarily to Canada) in 1999 (Maine Forest Service 2000). Sawmills in eastern Quebec and New Brunswick have lower power costs, can process smaller diameter logs, and often are not bound by the trade restrictions that limit exports of lumber to the United States from other parts of Canada.

White pine sawlogs are processed into millwork, furniture, and cabinet lumber, and can substitute for ponderosa pine, sugar pine, and other western millwork species. Red pine has characteristics of southern yellow pine and can be used to produce poles, dimension lumber, and cabin logs. Hemlock sawlogs usually are processed into dimension lumber and timbers.

Hardwood sawlogs of species other than aspen are used in the production of lumber. The bulk of the aspen sawlogs consumed in Maine is used to produce oriented strand board (OSB).

By definition all pulpwood is used to produce paper, though different species have different physical characteristics. Spruce-fir produces a strong fiber and is the most desirable for applications such as newsprint. Hemlock pulp is a partial substitute for spruce-fir but is not as strong. White pine is not highly valued as pulpwood. Hardwood fibers, which tend to be shorter and stiffer than those of softwoods, can be used to make printing, computer, and writing
papers. In recent years, changes in production technology and strength specifications have allowed greater substitution of hardwoods for softwoods in paper manufacturing.

**Interactions of markets with the forest resource**

The interaction between markets and the forest resource was examined by using Relative Utilization Coefficients (RUC). Luppolo and Baumgras (2001) developed these coefficients to evaluate the impact of markets on forest composition. A coefficient of 1.0 indicated that the species or species group was used in the same proportion at which it was represented in the inventory. The RUC increases as relative utilization increases and decreases as utilization decreases.

**Spruce-fir**

Historically, spruce-fir has been the most abundant and most often used species group in Maine. Spruce-fir sawtimber production increased dramatically between 1960 and 1999; the increases were greatest from 1966 to 1977 and from 1990 to 1999 (Table 2). By contrast, real prices for spruce-fir sawtimber increased moderately between 1966 and 1977 and then increased sharply in the 1990s (Table 3).

Production of spruce-fir pulpwood increased modestly in the early 1960s, fluctuated slightly from 1966 to 1989, and increased sharply during the 1990s. Pulpwood prices increased moderately from 1960 to 1983, decreased in the late 1980s, and then increased by more than 50 percent from 1990 to 1999 (Table 3). Increases in both pulpwood and sawtimber production led to continued increases in relative utilization (Table 4).

A declining resource base (growing stock inventory) usually would cause prices of that resource to increase, but prices of spruce-fir pulpwood decreased during the late 1970s and early 1980s, the period of highest production, as supplies of salvage and presalvage timber resulting from the spruce budworm infestation became available. During the 1990s, production of spruce-fir sawtimber increased by 40 percent and relative utilization increased even as inventories decreased. The low prices for sawtimber caused by the temporary increase in the supply of salvage and presalvage roundwood may have sent market signals that caused the industry in Maine to discount the long-term impact of spruce budworm and build or expand lumber production capacity during the 1980s. The lack of current resource data documenting the extent of the decline in spruce-fir inventory probably contributed to the industry’s short-term outlook.

Much of the decline in the production of spruce-fir pulpwood during the 1990s was due to an increase in lumber production. Such changes usually would be unexpected because sawlogs and pulpwood tend to be complimentary (they are different size materials) rather than substitutes. An unspecified but possibly significant portion of the increase in sawlog production was smaller diameter logs (down to a 4-inch small-end diameter) that previously would have been considered pulpwood. New sawmill technology adopted by Canadian mills allowed smaller diameter logs to be processed into dimension lumber (Taylor 2000). The adoption of small-diameter sawmilling technology along with 220-percent increase in exports
to Canada led us to conclude that much of the increase in spruce-fir sawtimber production in
the 1990s was from small-diameter sawlogs exported to Canada.

Pine

The production of pine (primarily white pine) sawtimber in Maine has increased since 1959,
with the greatest increase in the 1990s (Table 2). Because white pine is a millwork and
furniture species, pine sawtimber has brought high prices consistently. Although production of
pine increased fourfold, it remains relatively low compared to other pulpwood species.
Between 1959 and 1982, the relative utilization of pine was higher than for other softwood
species (Table 4), resulting in a lower proportional increase of these species in Maine’s forest
inventory (Table 1). Between 1972 and 1995, production of pine sawtimber and pulpwood
remained relatively stable resulting in a relative decline in utilization (Table 4). The decline,
in turn, has contributed to the proportional increases in growing-stock inventories since 1982
(Table 1).

Hemlock

Hemlock in Maine has been utilized to a greater extent for pulpwood than sawlogs. However,
in the 1990s production of hemlock sawtimber increased while pulpwood production remained
constant. From 1959 to 1971 hemlock growing-stock had a high relative utilization rate (Table
4). This rate dropped from 1971 to 1982 increasing in inventories of this species (Table 1).
Since 1982, the relative use of hemlock has increased, causing an absolute decline in growing-
stock inventory; however, since this decline is not as large as the budworm-induced decline in
spruce-fir, relative (proportional) volumes of hemlock increased.

Aspen

The real price of aspen sawtimber has consistently been the lowest of major softwood and
hardwood species (Table 3). Low prices encouraged the construction of three OSB plants in
Maine that became the primary consumers of what is termed aspen “sawtimber” in the State’s
timber cut reports but is actually growing-stock. The impact of the aspen consumption by these
plants is apparent in the increased use (Table 2) and stabilization of aspen growing stock
(Table 1) since the 1980s. Table 4 shows that the low utilization of aspen from 1959 to 1982
allowed inventories of this species to nearly double. When the OSB plants went on line during
the mid-1980s, aspen increased to nearly half of total hardwood sawtimber production (Table
2) and the RUC for aspen increased to about 1.3 (Table 4).

Other Hardwoods

In the early 1960s 60 percent of the hardwood roundwood harvested was pulpwood (Table 2).
By the late 1990s, the volume of hardwood pulpwood production had increased by more than
250 percent. This increase occurred in two stages. From 1960 to the late 1980’s Maine’s paper
industry expanded and used more hardwoods while spruce-fir pulpwood consumption remained
relatively constant despite an increase in the supply of salvage and presalvage material. Again
this reflects the diverting of smaller diameter spruce-fir to lumber production. In the 1990s the
production of hardwood pulpwood increased, making up half the void that resulted from the decline in the production of spruce-fir pulpwood. The primary reason for the increased use of hardwood pulpwood was relatively abundant hardwood inventories that resulted in relatively low prices of hardwood roundwood as well as changes in technology and markets that allowed greater use of hardwoods in papermaking.

While hardwood pulpwood production in Maine increased nearly fourfold since 1960, hardwood sawtimber production only doubled (Table 2). If aspen volume (primarily for OSB production) is subtracted from sawtimber production, the remaining sawtimber volume shows that only 16 percent of the hardwood harvested in the 1990s was used for lumber production. Further, the production of this adjusted measure for sawtimber volumes indicates that hardwood lumber decreased in Maine during the 1980s despite an increase in hardwood lumber production nationally.

This decline during the 1980s most likely was the result of the high proportion of northern hardwood species (sugar maple, beech, birch) in the State. Although these species were not in high demand by furniture and cabinet manufacturers during this period, prices for northern hardwoods have since increased in the 1990’s resulting in a 23- percent increase in the production of hardwood sawtimber in Maine.

Changes in the resource and the market since 1995

Since 1995 the relative utilization coefficients for aggregate hardwood and softwood growing stock in Maine have continued to converge (Table 4). Yet, major softwood species continue to be used at higher relative rates than hardwoods (Table 4). While differences between the relative growth rates of softwoods and hardwoods (softwoods grow faster) may work against all utilization coefficients converging to one in the long term, the fact that these coefficients are converging within a narrow range may reflect the market’s ability to adapt and use all species, particularly in a fiber-based market. The economic mechanism that facilitates this result is buyers’ behavior toward relative prices. As the relative price of one species increases, uses are found for relatively less expensive species even though the products being manufactured are not identical. For instance, paper manufactured from hardwood pulp may not have the same markets as paper manufactured from softwood pulp, but hardwood pulp may be produced at mills that previously manufactured softwood pulp. OSB manufactured from aspen does not substitute for spruce-fir lumber, but the same macro market forces that influence demand for dimension lumber also influence the demand for OSB.

Discussion and conclusions

The decline in spruce-fir inventories in Maine was the result of mortality caused by the spruce budworm and continued harvesting at levels required to satisfy demand for products manufactured from these species. However, the market substituted smaller diameter spruce-fir in the production of more valuable dimension lumber and substituted hardwoods and other softwoods for spruce-fir in the production of pulp. Adoption of new technologies or production processes was instrumental in both of these changes, though changes in relative resource prices facilitated this adoption (see roundwood market section). Also, the low relative
price of aspen encouraged the construction of OSB plants in Maine resulting in a much higher utilization rate for this species.

Several of the lessons learned from examining the timber situation in Maine may have important implications for other eastern states. A temporary increase in supply of a resource through salvage and presalvage harvest, such as that caused by the spruce budworm infestation in Maine’s spruce-fir could cause the relative price of the resource to decline. It would be a mistake to assume that this short-term phenomenon can be projected into the future. Mortality, increased harvest, and decreasing prices foreshadow a longer-term decrease in supply and increase in price. What makes it difficult to measure or time the market response is that response is not instantaneous and new technologies may mitigate or postpone the response. Changing technologies make it difficult to estimate econometric models or to base simulation models on coefficients developed from econometric models, because technological improvements change underlying production functions.

The use of aspen in OSB is another example of how technology can influence resource demand. The relatively low price and increasing inventory of aspen growing stock encouraged the building of OSB plants to use this resource. In Maine and other eastern states there is an increasing abundance of low-value red maple. The availability and low price of this species are causing researchers to examine the potential use of red maple in the production of other engineered wood products.

Simulation models based on biological parameters and projected demands are useful in the evaluation of forest sustainability, but it is difficult to model the impact of changing technology and subsequent changes in markets caused by technological changes. An alternative approach is to assume that the market will adjust to changes in the resources in the long run by using species at rates consistent with their relative abundance. Therefore, an alternative method may be to assume that in the long run, the relative rates of resource utilization will stabilize at levels consistent with species growth.

Perhaps the most significant point that can be drawn from the forest situation in Maine is that both forests and markets are resilient. So as long as the productive capacity of the land is maintained, forests will regenerate. Therefore, it may be more important to be concerned with how forests are harvested than with the amount of roundwood removed.

**Literature cited**


Table 1. Softwood and hardwood growing-stock inventories for selected species in Maine, by species group\(^1\)

<table>
<thead>
<tr>
<th>Year</th>
<th>Spruce-fir</th>
<th>Pine</th>
<th>Hemlock softwood</th>
<th>All Aspen</th>
<th>All hardwood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in million cubic feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1959</td>
<td>6,882 (^{2})</td>
<td>1,468 (\text{(8.9)})</td>
<td>892 (\text{(5.4)})</td>
<td>10,746 (\text{(65.1)})</td>
<td>605 (\text{(3.7)})</td>
</tr>
<tr>
<td>1971</td>
<td>10,576 (\text{(49.5)})</td>
<td>1,508 (\text{(7.1)})</td>
<td>1,147 (\text{(5.4)})</td>
<td>14,556 (\text{(68.1)})</td>
<td>748 (\text{(3.5)})</td>
</tr>
<tr>
<td>1982</td>
<td>8,946 (\text{(39.9)})</td>
<td>2,032 (\text{(9.1)})</td>
<td>1,323 (\text{(5.9)})</td>
<td>14,298 (\text{(63.8)})</td>
<td>1,238 (\text{(5.5)})</td>
</tr>
<tr>
<td>1995</td>
<td>6,130 (\text{(29.3)})</td>
<td>2,132 (\text{(10.2)})</td>
<td>1,286 (\text{(6.2)})</td>
<td>11,680 (\text{(55.9)})</td>
<td>1,225 (\text{(5.5)})</td>
</tr>
</tbody>
</table>

\(^1\) From USDA Forest Service survey data.  
\(^2\) Percentage of all species in parenthesis.

Table 2. Average annual softwood and hardwood sawtimber and pulpwood harvested in Maine for selected periods from 1960 to 1999 \(^1\)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawtimber</td>
<td>Million cubic feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spruce-fir</td>
<td>32.9</td>
<td>47.0</td>
<td>72.7</td>
<td>83.3</td>
<td>85.6</td>
<td>102.5</td>
<td>128.7</td>
</tr>
<tr>
<td>Pine</td>
<td>25.2</td>
<td>24.8</td>
<td>31.1</td>
<td>31.2</td>
<td>30.2</td>
<td>33.7</td>
<td>42.9</td>
</tr>
<tr>
<td>Hemlock</td>
<td>5.9</td>
<td>3.8</td>
<td>7.5</td>
<td>10.9</td>
<td>11.8</td>
<td>16.5</td>
<td>16.6</td>
</tr>
<tr>
<td>Total softwood sawtimber</td>
<td>68.1</td>
<td>81.9</td>
<td>118.9</td>
<td>131.3</td>
<td>134.3</td>
<td>159.1</td>
<td>196.5</td>
</tr>
<tr>
<td>Aspen</td>
<td>0.4</td>
<td>0.5</td>
<td>0.9</td>
<td>3.8</td>
<td>18.7</td>
<td>20.0</td>
<td>21.6</td>
</tr>
<tr>
<td>Total hardwood sawtimber</td>
<td>30.5</td>
<td>33.3</td>
<td>31.9</td>
<td>27.4</td>
<td>39.5</td>
<td>48.8</td>
<td>57.1</td>
</tr>
<tr>
<td>Pulpwood</td>
<td>Million cubic feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spruce-fir</td>
<td>126.3</td>
<td>144.3</td>
<td>133.8</td>
<td>146.2</td>
<td>133.2</td>
<td>78.4</td>
<td>58.4</td>
</tr>
<tr>
<td>Pine</td>
<td>4.5</td>
<td>11.7</td>
<td>13.7</td>
<td>17.0</td>
<td>20.6</td>
<td>17.2</td>
<td>20.5</td>
</tr>
<tr>
<td>Hemlock</td>
<td>14.5</td>
<td>21.7</td>
<td>17.5</td>
<td>17.2</td>
<td>26.9</td>
<td>26.3</td>
<td>24.5</td>
</tr>
<tr>
<td>Total softwood pulpwood</td>
<td>145.8</td>
<td>178.9</td>
<td>165.6</td>
<td>181.7</td>
<td>180.8</td>
<td>128.3</td>
<td>105.3</td>
</tr>
<tr>
<td>Total hardwood pulpwood</td>
<td>45.8</td>
<td>63.9</td>
<td>75.7</td>
<td>100.7</td>
<td>114.7</td>
<td>140.1</td>
<td>166.0</td>
</tr>
<tr>
<td>Total pulpwood</td>
<td>191.6</td>
<td>242.7</td>
<td>241.3</td>
<td>282.4</td>
<td>295.5</td>
<td>268.3</td>
<td>271.3</td>
</tr>
</tbody>
</table>

Table 3. Average price of softwood and hardwood sawtimber and pulpwood roundwood in Maine for selected periods from 1960 to 1999\(^1\)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawtimber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spruce-fir</td>
<td>259.4</td>
<td>263.7</td>
<td>277.2</td>
<td>301.5</td>
<td>283.3</td>
<td>375.2</td>
<td>510.0</td>
</tr>
<tr>
<td>Pine</td>
<td>290.8</td>
<td>297.7</td>
<td>328.2</td>
<td>410.0</td>
<td>469.8</td>
<td>492.3</td>
<td>570.2</td>
</tr>
<tr>
<td>Hemlock</td>
<td>252.8</td>
<td>243.2</td>
<td>228.5</td>
<td>210.6</td>
<td>175.1</td>
<td>194.8</td>
<td>253.8</td>
</tr>
<tr>
<td>Yellow birch</td>
<td>283.8</td>
<td>317.4</td>
<td>372.4</td>
<td>394.8</td>
<td>375.7</td>
<td>385.9</td>
<td>513.4</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>289.4</td>
<td>292.2</td>
<td>325.5</td>
<td>364.4</td>
<td>357.4</td>
<td>414.9</td>
<td>678.2</td>
</tr>
<tr>
<td>Red maple</td>
<td>210.8</td>
<td>224.3</td>
<td>219.5</td>
<td>200.2</td>
<td>182.0</td>
<td>226.4</td>
<td>342.9</td>
</tr>
<tr>
<td>Oak</td>
<td>300.7</td>
<td>328.9</td>
<td>360.2</td>
<td>511.9</td>
<td>685.8</td>
<td>900.1</td>
<td>1113.2</td>
</tr>
<tr>
<td>Aspen</td>
<td>190.4</td>
<td>196.4</td>
<td>184.9</td>
<td>166.8</td>
<td>138.3</td>
<td>171.8</td>
<td>200.7</td>
</tr>
<tr>
<td>Pulpwood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spruce-fir</td>
<td>140.2</td>
<td>141.0</td>
<td>131.6</td>
<td>124.7</td>
<td>122.7</td>
<td>149.4</td>
<td>196.1</td>
</tr>
<tr>
<td>Pine</td>
<td>39.8</td>
<td>47.0</td>
<td>57.6</td>
<td>62.5</td>
<td>59.9</td>
<td>62.5</td>
<td>66.8</td>
</tr>
<tr>
<td>Hemlock</td>
<td>80.7</td>
<td>78.4</td>
<td>83.3</td>
<td>79.8</td>
<td>70.1</td>
<td>82.6</td>
<td>104.7</td>
</tr>
<tr>
<td>Hardwood</td>
<td>60.7</td>
<td>76.8</td>
<td>73.9</td>
<td>78.9</td>
<td>79.2</td>
<td>75.1</td>
<td>84.6</td>
</tr>
</tbody>
</table>


Table 4. Relative utilization coefficients for Maine growing stock

<table>
<thead>
<tr>
<th>Survey period</th>
<th>Spruce fir</th>
<th>Pine</th>
<th>Hemlock</th>
<th>Softwood(^1)/Aspen</th>
<th>Hardwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959 to 1971(^2)</td>
<td>1.16</td>
<td>1.29</td>
<td>1.30</td>
<td>1.10</td>
<td>0.39</td>
</tr>
<tr>
<td>1971 to 1982</td>
<td>1.19</td>
<td>1.37</td>
<td>1.14</td>
<td>1.10</td>
<td>0.52</td>
</tr>
<tr>
<td>1982 to 1995</td>
<td>1.24</td>
<td>1.12</td>
<td>1.39</td>
<td>1.11</td>
<td>1.29</td>
</tr>
<tr>
<td>1995 to 2000(^3)</td>
<td>1.21</td>
<td>1.14</td>
<td>1.29</td>
<td>1.02</td>
<td>1.30</td>
</tr>
</tbody>
</table>

\(^1\) Includes underutilized species such as larch and northern white-cedar.
\(^2\) Harvest data from Maine Forest Service data, inventory data from USDA Forest Service.
\(^3\) Based on 1995 inventory estimates.