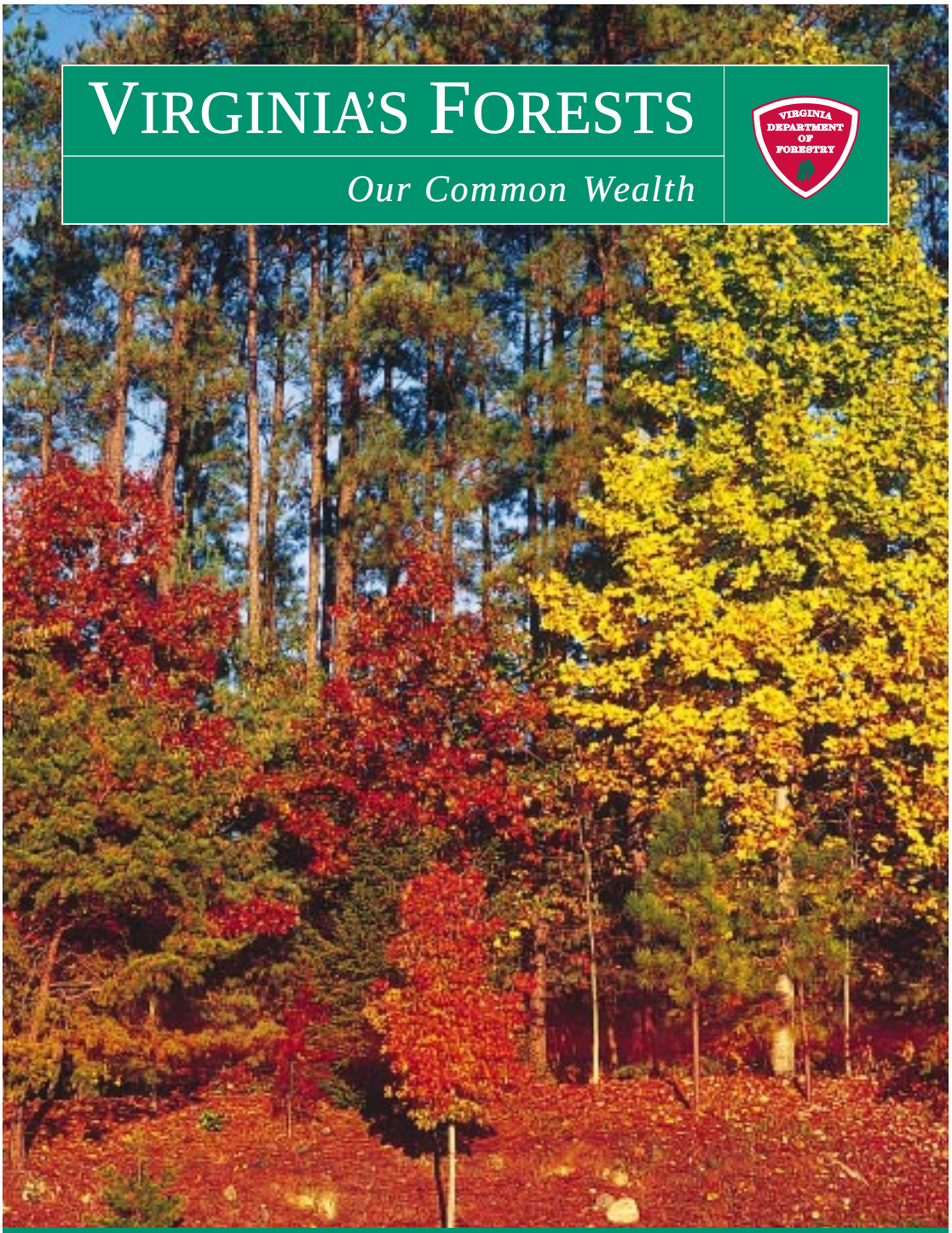
VIRGINIA'S FORESTS

Our Common Wealth



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VIRGINIA DEPARTMENT OF FORESTRY

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THE ECONOMIC IMPORTANCE OF VIRGINIA'S FOREST RESOURCES

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EXECUTIVE SUMMARY

"The Virginia Strategy - Prosperity into the New Century" *states that key issues to maintain a thriving forest industry include "availability of land, availability of capital, and awareness on the part of the general public of the benefits of natural resource based industries".*

SOME MAJOR ATTRIBUTES AND BENEFITS OF VIRGINIA'S FORESTS AND ITS FOREST INDUSTRY ARE:

- Virginia has 16 million acres of forestland with over 15.4 million acres classified as commercial forest.
- Non-industrial private landowners hold 77 percent of Virginia forestland.
- Landowners received over $345 million in stumpage for their timber in 1999.
- Timber harvesting contributes over $863 million annually to the economy.
- Specialty and non-timber forest products contribute over $60 million annually to Virginia's economy.
- Forest-related recreational spending contributes more than $3 billion annually to Virginia.
- Carbon sequestering and pollution control value exceeds $1.9 billion annually.
- Every $1 landowners receive for their timber generates $35.39 of Value-Added to Virginia's economy.
- In its entirety, Virginia's Forests provide over $30 billion in benefits annually to the Commonwealth.

The economic importance of Virginia's forest resources and the increasing demand for forest products are here to stay. At 6.8 million and growing, the state's population is placing even greater demands on our remaining forestlands and the resources they provide. The sustained stewardship of the forest resources, and their contribution to the lives of the people of the Commonwealth is the mission of the Department of Forestry.

Virginia's forests are the backbone to a strong economy and healthy environment.

Virginia's forest products industry provides a vital source of income and jobs to many rural areas and smaller cities. The harvesting, processing and marketing of forest products generates over $25.4 billion annually to Virginia's economy and accounts for over 248,000 jobs.

Opportunities for growth in the forest products industry still exist, especially in the areas of value-added products. Non-timber utilization of Virginia's forests will also continue to grow. Stronger conservation of the forest land base and a greater knowledge of how forests and people interact are necessary if the benefits of forestlands are to be sustained.

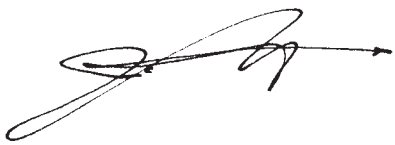
INTRODUCTION

The "value" of Virginia's forests is many things to many people. To some, the value lies in the beauty of the forests. Landowners and the forest products industry consider the utilization of the resource as the most valuable asset. Whatever the "value", we must recognize that Virginia's forests provide a renewable natural resource that extends from harvesting timber to natural beauty. Whether it's a walk in the urban forest or a hunter in the rural forest, all Virginians can enjoy this resource as it continues to provide a necessary framework for our daily lives.

The Virginia Department of Forestry, using the IMPLAN PRO economic model for Virginia, has completed its fourth comprehensive evaluation of Virginia's forestland. The first report was completed in 1985 with revisions in 1988 and 1994. The availability of new information has made it possible to revise the forest economic outlook. The numbers used are real and in those cases where estimates have been used, the more conservative number was used when different estimates were obtained.

Virginia's forests still cover nearly two-thirds of the state, an extraordinary figure considering the overwhelming population growth in some areas. Virginia stands to lose some of its resource base to future urban growth. The importance of forests in cleansing the air, purifying our water, providing products, and fostering recreation opportunities must be embraced as we begin the 21st century. Our Virginia standard of living depends on the abundance and stability of the forest resource. From the hardwood forests in the majestic mountains to the pine forests of the Chesapeake Bay, the role of forests continues to be different for each person. We must realize that as varied as our reasons for enjoying forests are, a commonality exists among us all.

This report substantiates that the value of Virginia's forests is in fact … Our Common Wealth



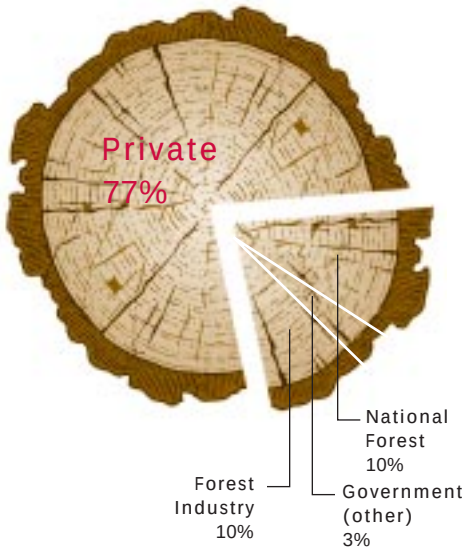
James W. Garner, State Forester

THE FOREST RESOURCE

Present Condition

FIGURE 1

VIRGINIA TIMBERLAND OWNERSHIP



OWNERSHIP	ACRES
Private	11,909,501
Farmer (3,870,366)	
Private Individual (6,489,600)	
Other Corporate (1,549,535)	
Forest Industry	1,554,763
National Forests	1,468,126
Government (other)	515,160
State, County, Municipal (293,881)	
Other Federal (221,279)	
TOTAL	15,447,550

TABLE 1

COMMERCIAL FORESTLAND TIMBER TYPES

FOREST TYPE	ACRES
Upland Hardwood	9,518,571
Lowland Hardwood	635,021
Oak-Pine	1,941,207
Natural Pine	1,880,427
Pine Plantations	1,472,324
TOTAL	15,447,550

Virginia is blessed with a multitude of forest resources. Of the 25.4 million acres of land, over 60 percent (16 million acres) is covered in forests, with the vast majority (15.4 million acres) classified as commercial forestland (timberland). Nearly every county in Virginia has abundant forestlands. In addition to commercial forestland, there are over 500,000 acres of non-commercial forestland including woodlands and reserved forests that provide numerous benefits such as: recreation, watershed protection, wildlife habitat, and preserves for unique habitat. To better manage this resource, the Virginia Department of Forestry, in cooperation with the USDA Forest Service, conducts a Forest Inventory and Analysis (FIA) to characterize the condition of Virginia's forests. Results of the current FIA should be available in 2002; the last assessment was completed in 1992.

Non-industrial private forest landowners (NIPF) own 77 percent of the commercial forestland (Figure 1), forest industry owns 10 percent, and the remaining 13 percent is owned by federal, state, and local governments [1].

Virginia's forests are divided into five major timber types (Table 1). Based on the 1992 Forest Inventory, hardwood types cover 78 percent of the total forest acreage and pine types cover the remaining 22 percent. The next inventory will probably show, for the first time, pine plantation acreage exceeding that of natural pines. Loblolly pine is the dominant conifer and yellow poplar is the most abundant hardwood species, although oaks as a group outnumber yellow poplar in number and volume.

The most positive change in Virginia's forest over the last 50 years has been in the volume of standing timber. From 1940 to 1992, the volume of growing stock increased by 155 percent, from 10.4 to 26.5 billion cubic feet. Hardwood accounted for 85 percent and softwood for 15 percent of the increase. This volume increase occurred while the forests continued to provide an increasing supply of sawtimber and pulpwood to be manufactured into paper, furniture, cabinets, veneer, poles, posts, pilings, lumber for homes, and other products. Today, we harvest over 1.4 billion board feet of sawtimber and three million cords of pulpwood annually. In 1940, Virginia's timber resource could have provided enough lumber for two million homes. Today, we have enough timber for more than six million homes. More significant is the fact that enough timber has been harvested in Virginia since 1940 to build over five million homes [1,2,6].

This wonderful success story will continue only with a dedicated effort to conserve the forest land base and maintain high quality forest management. According to "*The Virginia Strategy - Prosperity into the New Century*", key issues include "availability of land, availability of capital,

and awareness on the part of the general public of the benefits of natural resource based industries" [3].

Preliminary survey results indicate an average annual loss of forestland of 54,000 acres since 1992, up from a 20,000 acres annual loss during the previous survey period. Final estimates of forest loss, as well as estimated timber growth and removal rates, will be available later this year.

Risks to the Resource

Virginia's forests are continually at risk from the adverse effects of native and exotic pests, severe weather, wildfire, and human activities. Periodic outbreaks of native bark beetles have killed millions of dollars worth of pine sawtimber at least once a decade since records have existed. The gypsy moth has repeatedly defoliated several million acres of Virginia's oak forests since its first limited outbreak in 1984. Just in the past few years, major ice storms, hail, and hurricanes have caused tree defoliation, breakage, and wind damage over hundreds of thousands of acres. Drought has often been an additional stress to forests across the Commonwealth, and was particularly severe in 1998 and 1999. The combined impact of all these events has left an unusually large and dangerous accumulation of fuel for wildfires.

VIRGINIA'S FORESTS ARE CRITICAL TO A PROSPEROUS ECONOMY

Human activities impose both direct and indirect risks on forest resources, which in turn impacts wildlife, water, and other resources. Every year, some forests are lost through conversion to other land uses. The remaining forestland is gradually altered in both character and utility by fragmentation from residential, commercial, and agricultural development. The present forest inventory will show how much impact these factors have had on Virginia's forests. Human caused changes in air quality impact all forestland. Global commerce results in the continual introduction of exotic organisms. Experience with chestnut blight, Dutch elm disease, the gypsy moth, and many other foreign pest problems indicate that the risk of new introductions is great.

The forests of Virginia are vital to insuring a prosperous and high quality of life to the people of the Commonwealth. Not only are they needed to maintain our thriving wood products industries, forests also attract tourists, provide recreational opportunities, protect air and water quality, and provide homes for people and wildlife. Following is a characterization of the various benefits that we annually receive from Virginia's Forests.

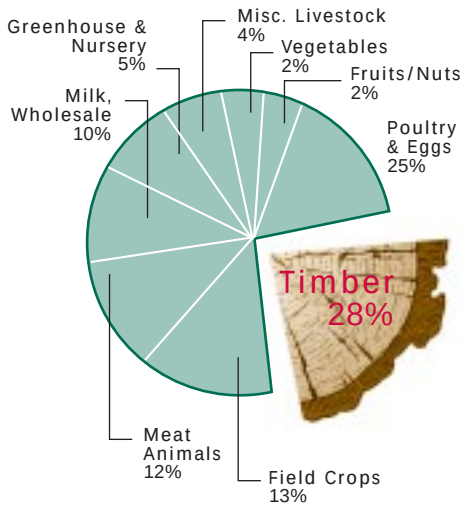
FOREST INDUSTRY ECONOMIC CONTRIBUTIONS

The management, sale, harvesting and processing of forest products, along with construction contributions, added over $25 billion to Virginia's economy in 1999.

FIGURE 2

1999 MARKET VALUE OF CROPS

CROP	VALUE
Timber	$863,563,712
Poultry & Eggs	$786,825,000
Field Crops	$411,313,000
Meat Animals	$368,569,000
Milk, Wholesale	$292,648,000
Greenhouse & Nursery	$170,731,000
Misc. Livestock	$131,462,000
Vegetables	$68,435,000
Fruits/Nuts	$53,057,000



This value has been steadily rising over the past several years. To continue this increase, more emphasis will be needed to encourage better forest management, additional development of value-added processing and specialty forest product production.

Forest Management and Related Services

The growing and management of forests for timber and other resources is essential to ensuring that Virginia's Forests can sustain the multitude of benefits we expect. These activities include planting or regenerating high quality trees; protecting forests from fire, insects, disease, competition and other threats; and providing professional assistance to landowners. Improved management and utilization will be needed to maintain and increase the future vitality and sustainability of Virginia's Forests.

- The Direct Economic Impact of these activities in 1999 was over $160 million.
- The Total Economic Output of these activities in 1999 was over $370 million.
- The Total Value-Added Impact in 1999 was over $275 million.

Harvesting

In 1999, around 1,700 logging operations employing more than 6,800 workers were involved in harvesting Virginia's timberland [4]. These operations had a direct economic impact of over $863 million to the economy [5]. Many of these activities occur in the more rural areas of the state where timber harvesting provides much needed income to local landowners and jobs for rural communities.

The $863 million is also considered the market value of the harvested timber when transported to the first point of delivery. This was first in value and accounted for 28 percent of the total when compared to market values of Virginia agricultural crops as shown in Figure 2 [5,6,7].

FIGURE 4

VIRGINIA SAWTIMBER HARVESTS

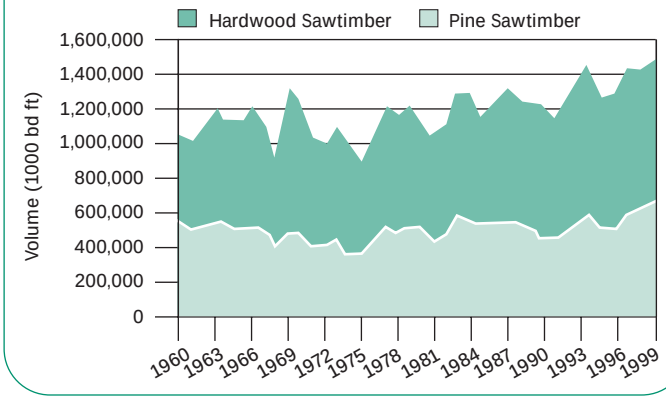
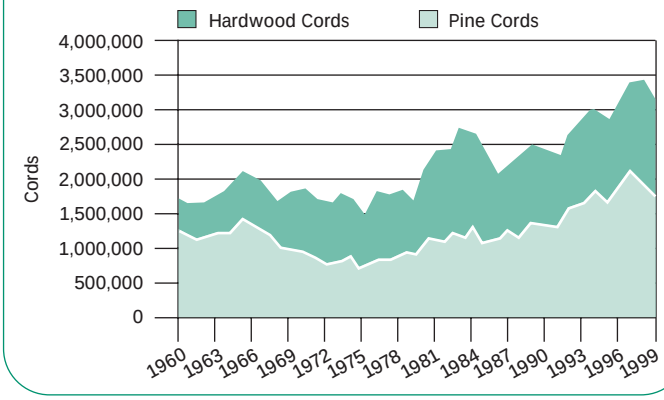


FIGURE 5

VIRGINIA ROUNDWOOD VOLUME



Primary Manufacturing

Primary processing converts raw materials into lumber, veneer, railroad ties, poles, posts, barrel staves, handles, wood pulp, paper, particle board, fiber board, oriented strand board (OSB), laminated veneer lumber (LVL), laminated strand lumber, chemicals, and other products.

Hardwood sawmill production has surpassed pine production every year since 1970. This pattern should continue into the foreseeable future. Combined production produced over 1.4 billion board feet in 1999 from Virginia's forests (Figure 4) [6].

During the past several years, two "new" products have contributed to the increased use of hardwood: oriented strand board (OSB) and laminated veneer lumber (LVL). In addition to new products, other factors have contributed to higher production in the south, including western U.S. timber harvesting reductions, increased domestic and foreign demand, and the maturing of hardwood forests in Virginia.

Roundwood pulpwood production increased from one million cords in 1950 to 3.4 million cords in 1998. Pine continues to be the dominant pulpwood species, although the use of hardwoods has increased considerably since 1960 (Figure 5). In addition, approximately 1.4 million tons of wood residues (mostly wood chips, sawdust and shavings from mills) are provided to pulp and composite mills annually [8].

- The Direct Economic Impact from Primary Forest Products Manufacturing in 1999 was over $5.3 billion.
- The Total Economic Output from Primary Forest Products Manufacturing in 1999 was over $9.6 billion.
- The Total Value-Added from Primary Forest Products Manufacturing of timber in 1999 was over $4.4 billion.

Secondary Manufacturing

Secondary manufacturing processes lumber, pulp, paper, particle board, and other primary products into other components or final products. These include boxes, cartons and other packaging materials, furniture, cabinets, dimension and component parts, flooring, paneling, molding, pallets, household goods, instruments, and crafts.

Virginia continues to be one of the largest producers of wood furniture in the United States. The furniture industry is the major manufacturer in the secondary sector and accounts for about one-third of the value. Other large manufacturers in the secondary sector are paper container producers, and pallet, cabinet, and wood flooring manufacturers.

As materials go through the processing chain from raw material to finished products, every step provides additional jobs and income to the area. By converting raw resources into finished products locally, Virginia can maximize the benefits it receives from our forests.

With the population expanding, construction increasing, and demands for industrial and consumer products growing, opportunities to expand secondary manufacturing should continue to increase.

- The Direct Impacts from secondary manufacturing, including construction, contributed over $5.4 billion to Virginia's economy in 1999.
- The secondary manufacturing, including construction, had a Total Economic Impact of over $12.9 billion to Virginia's economy in 1999.
- The Total Value-Added from Secondary Forest Products Manufacturing, including construction, was over $6.1 billion in 1999.

FIGURE 6

VALUE-ADDED TO FOREST PRODUCTS

Stumpage $1.00

=

Forest Management $0.40

+

Harvesting $1.42

+

Primary Processing $5.05

+

Secondary Processing $5.77

+

Indirect Impacts $4.83

+

Construction $3.12

+

Induced Impacts $14.81

TOTAL VALUE-ADDED INTO VIRGINIA'S ECONOMY $35.40

Value-Added

Value-added is the increased worth of a product as additional processing takes place. Each step harvested timber takes, from stump to final product, adds value to a product and the economy of Virginia. Through this process, the $345 million paid landowners for their standing trees (stumpage value) in 1999, generated over $12.2 billion in Total Value-Added Impacts [5]. Every dollar paid to Virginia landowners provides $35.40 worth of Total Value-Added to Virginia's economy (Figure 6).

The largest sector of value-added is induced economic impacts. This is the economic activity attributable to household income generated by Virginia's forest products industry. Induced economic impacts exceeded $5.1 billion in the Commonwealth.

The second largest sector is direct impacts; comprised of primary and secondary manufacturing, and including forest management and harvesting, which exceeded $4.3 billion.

The third sector, indirect impacts, is comprised of construction, services, marketing and transportation, which exceeded $2.7 billion.

Economic Output

Economic Output is the total value of products that an industry produces. This includes all materials that are necessary to produce the products, along with labor, profit and other costs of doing business. When all of these impacts are combined, the forest products industry and related businesses generate an economic output of over $25.4 billion annually in Virginia (Table 2) [5].

Retail sales of forest products generate billions of dollars more to the economy of Virginia.

TABLE 2

TOTAL ECONOMIC CONTRIBUTION OF VIRGINIA'S FOREST PRODUCTS INDUSTRY 1999

Forest Management	$ 160,909,437
Stumpage	$ 345,098,045
Logging	$ 863,563,712
Primary	$ 5,304,669,888
Secondary	$ 5,413,544,822
Construction	$ 2,819,137,595
Indirect Impacts	$ 2,983,862,172
Induced Impacts	$ 7,589,917,631
TOTAL	$25,480,703,302

TABLE 3

SECTOR	Employment	Salaries & Wages (million $)	Value Added (million $)	Capital Expenditures (million $)
Lumber & Wood Products	27,239	700.9	3,786.8	56.4
Furniture & Fixtures	21,914	515.0	1,659.5	52.0
Paper & Allied Products	17,943	787.5	4,965.1	44.9
Total All Wood Manufacturing	67,096	2,003.4	10,411.4	153.3
All Manufacturing	404,900	14,102.7	83,803.9	1,224.1

Survey of Virginia Manufacturers

Processing of forest products is a major contributor to the manufacturing sector of the Virginia economy (Table 3) [5, 9, 10].

As a group, the forest products industry ranks first in manufacturing jobs, accounting for one in every six manufacturing employees and first in salaries and wages with $1 out of every $7 paid out to employees. It also accounts for $1 out of every $8 of value added through manufacturing.

Capital Investment and Employment

Since 1994, forest product companies have planned capital expenditures of over one billion dollars for new or expanding manufacturing plants and increases of over 6,000 new jobs [11].

More than 248,000 Virginians are employed by forest-related industries and businesses (Table 4). For each manufacturing job created, an additional two support/service jobs, such as trucking, are created. Every county, city, and town benefits directly or indirectly from the forest products industry [5].

TABLE 4

FOREST INDUSTRY RELATED-EMPLOYMENT

SECTOR	NUMBER EMPLOYED
Forest Management & Harvesting	11,250
Primary & Secondary Manufacturing	63,094
Construction	34,272
Indirect Impacts	32,013
Induced Impacts	107,469
TOTAL	248,098

FIGURE 7

1999 VIRGINIA FOREST PRODUCTS EXPORTS

COUNTRY	VALUE ($millions)
Italy	86.3
Spain	68.5
Germany	46.4
Japan	44.8
United Kingdom	44.1
Hong Kong	26.3
Taiwan	22.2
South Korea	16.8
China	13.2
Belgium	13.0

Export Markets

Virginia forest products in the form of logs, lumber, chips, pulp, paper, and finished goods are sold to markets all over the world. Exports continue to play an increasing role in the economic value of forest products in Virginia (Figure 7). Countries importing the greatest amount of Virginia forest products in 1999 were Italy, Spain, Germany, Japan, and the United Kingdom. Canada is also an important importer, but actual values are not available. In 1999, the total value of Virginia forest products exports was estimated at over $498 million [12].

Tax Revenues

Forest products industries and landowners make significant contributions to local schools, roads and other tax-funded governmental services. These revenues include forestland property taxes, forest products taxes, sales taxes, corporate and business taxes, and state and federal income taxes.

A precise estimate of forest products related taxes paid by landowners, employees, and industry is not available. However, one of the taxes paid by industry is the forest products tax. This tax is based on the amount of raw wood material obtained. In 1999, over $1.8 million was collected [6]. This, along with some matching funds from the General Assembly, is used in the Reforestation of Timberlands program to provide financial assistance to private landowners. Over 51,000 acres were reforested in 1999 by landowners benefiting from this program [13].

ECONOMIC BENEFITS TO LANDOWNERS

Private landowners owned over **13.4 million acres** of forestland in 1992. This land was divided among **468,000 landowners**, with an average tract size of **less than 29 acres** [14]. Average forested tract size is expected to decrease as more land is divided into smaller parcels. Completion of the current forest survey will provide updated information on how the ownership of forestland in Virginia has changed and possible impacts this may have in the future.

Virginia landowners receive many benefits from forestland ownership, and some of these benefits contribute to Virginia's economy. Income is derived from timber sales, hunting, fishing and recreational leases, specialty products such as Christmas trees, firewood, maple syrup, pine garland production, and other products.

Studies show that landowners who use professional assistance receive 23 percent more income per acre and 64 percent more per board foot [15].

Forest Products Revenues

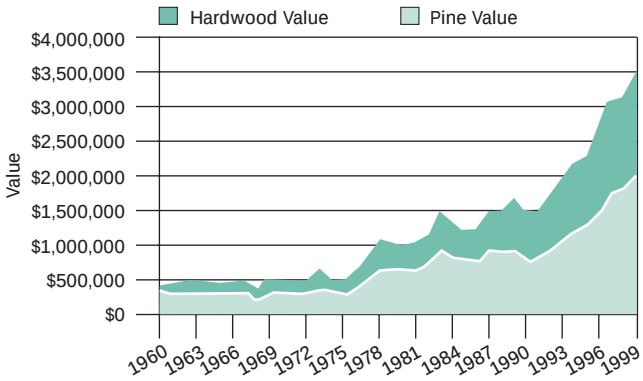
In 1999, Virginia landowners were paid over **$345 million** for trees harvested from their land [6]. Other income was derived from the sale of special forest products such as firewood, pine tips, horticultural and medicinal plants, Christmas trees, and maple syrup. Landowners also receive money from hunting leases and other recreational activities.

Virginia is fortunate to have a strong, professional forestry work force available to provide management and marketing services to Virginia landowners.

Most landowners sell their trees as standing timber known as stumpage. Stumpage revenues have increased over 700 percent since 1960 with the greatest increase in sawtimber (Figure 8) [16].

FIGURE 8

STATE STUMPAGE VALUES



Reforestation

Landowners harvesting their timber often invest in forest regeneration practices following harvest. In 1999, Virginia landowners invested $11 million on reforestation, which includes site preparation, tree planting, and other practices. Most of this work was done through small private contractors. During 1999, Virginia landowners reforested over 102,000 acres with another 18,000 acres regenerating naturally [13]. These long-term investments are essential to maintaining Virginia's forests for the future.

Risk of Investment

There are risks involved with any long-term investment and this is especially true with growing timber. Over the last 10 years, Virginia's forests have been impacted with insect and disease outbreaks, ice storms, and other natural disasters that have damaged or killed thousands of acres of trees. Although some of this timber was salvaged, the loss to landowners was still millions of dollars.

Other potential risks to Virginia's forests are uncontrolled forest fires, land-use changes and forest land management restrictions.

The rate of conversion of forestland is related to the amount of risk and costs that landowners must bear to manage their land. Land-use policies can have major impacts on our forest resources.

One of the greatest potential threats to our forestlands is the conversion of forestland to other land uses. Unlike timber harvesting, where trees are allowed to regenerate, once an area is converted to an industrial park, sub-division, strip mall, etc., it will be lost as forestland indefinitely.

SPECIALTY FOREST PRODUCTS

Specialty forest products tend to be unique, regional or seasonal in nature, and have little relationship to traditional commodity products such as lumber, veneer or chips. They may be products that are collected without cutting trees down, such as maple syrup, naval stores (turpentine, pine rosin, etc.), pine tips for garlands, fruits and nuts, pine cones and pine straw; products found only in forested areas, such as rhododendron, grapevines, mushrooms, ginseng, moss, and other botanical or medicinal plants; products from harvested trees, such as firewood, burl and crotch wood for fine crafts, highly figured wood for custom furniture and musical instruments, bark for crafts or mulch, and lighter wood from pine stumps; or plants grown for specific uses, such as Christmas trees, horticultural use, or orchards.

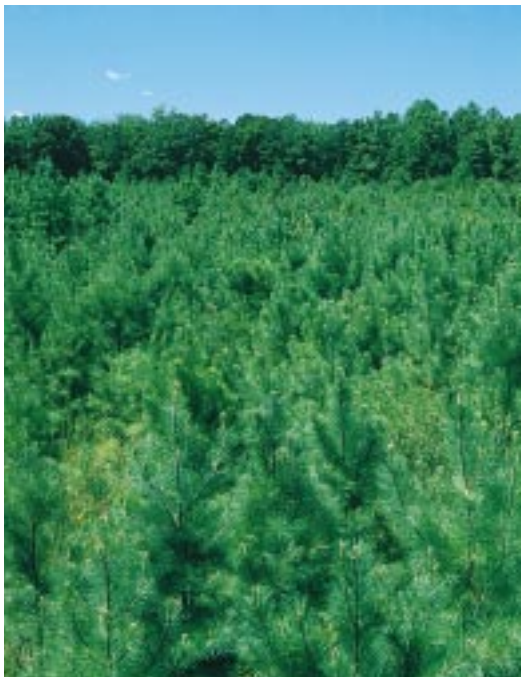
Horticulture and Christmas Tree Industry

The wild collecting and growing of trees for the horticulture industry is expanding every year. As Virginia becomes more urbanized, the demand for trees in the landscape is increasing. Another horticultural forest product is bark for growing medium and mulch. Several bark processing plants in Virginia sell bulk and packaged bark products. In the past, much of this product was disposed of by burning or dumping in landfills. The greenhouse and nursery industries provide around $170 million annually to the economy of Virginia [7]. Although it is not considered or included as part of the value of Virginia's forests, much of it is forestry-related.

Virginia apple and peach orchards produced over $43 million in 1999 [7].

The Virginia Christmas Tree industry consists of hundreds of Christmas tree farms, which harvest and sell more than one million trees each year.

THE VIRGINIA CHRISTMAS TREE BUSINESS IS A $34 MILLION INDUSTRY [27]



Christmas Greenery Industry

Associated with the Christmas tree industry is the greenery industry. Branch tips of white pine, Fraser fir, and other evergreens are cut in the fall of the year and sold to local manufacturers. The tips are used for Christmas wreaths, rope garland and other holiday decorations. This regional cottage industry provides income and seasonal employment to several hundred residents and landowners. Tipping, garland and wreath sales exceed $16 million annually [17].

Other Forest Products

Virginia's forests provide the Commonwealth with a variety of products that contribute a small percentage to the economy, but are very important to many rural areas.

Ginseng, mushrooms, fruit, maple syrup, honey, nuts and other botanical and medicinal plants, are collected for personal use and to be sold locally or overseas. Others are grown or collected for value-added specialty forest products that are used in floral and craft industry, custom furniture and woodworking. These materials are used by the collectors to produce items for sale, or are sold to buyers that distribute them to retail stores. These forest products include dried flowers and plants, sheet moss, burls, grapevines, pine cones, firewood, and specialty woods. Specialty products provide millions of dollars to local rural economies each year [18].

FOREST - RELATED VALUES

Many benefits of the Commonwealth's forests are derived not from products, but from experiences and environmental attributes.

- Virginians spend many hours hiking, camping, hunting, fishing or taking pictures.
- Forests provide relief from the noise and pollution of industrial areas and congested urban sprawl.

Wildlife-Related Recreation

According to the 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, over 2.3 million Virginia residents participated in wildlife related activities. Along with non-residents, they spent $2.1 billion on trip-related expenses, equipment, licenses, and other fees. Approximately 80 percent of these activities, $1.68 billion, are associated with the forests of Virginia [19].

Forest-Related Recreation

Backpacking, hiking, camping, forest viewing, and other forest-related recreation generate a large amount of economic activity. Based on the Virginia Tourism Corporation's 1997/98 Visitor Survey, it is estimated that visitors (people traveling over 100 miles) spent over $1.34 billion in pursuit of these activities. Millions more were spent by Virginia residents and visitors traveling less than 100 miles [20].

ONE OF OUR MOST BASIC RESOURCES, CLEAN WATER, COMES FROM OUR FORESTS.

Other Values

The 16 million acres of Virginia's forestland provide a variety of other benefits that improve the value of the land and the quality of life for the citizens of the Commonwealth.

Water Quality and Erosion Control

Forests work as natural filters that remove pollutants from the air and water. This natural cleaning process reduces the amount and cost of treating water from forested watersheds and riparian areas and helps purify the air we breath. Approximately 50 percent of Virginia's streams have forest buffers. Because of their high value in stabilizing stream banks and reducing sedimentation, storm water runoff, and water pollution, Virginia is investing millions of dollars to protect and increase the extent of riparian forests [21].

Air Pollution and Carbon Dioxide Reduction

Trees are the cheapest and most efficient way to sequester and store carbon from the atmosphere, which reduces the impact from burning fossil fuels. The trees of Virginia's forests contain over 392 million metric tons of carbon, which is equivalent to removing over 1.4 billion metric tons of carbon dioxide from the air. This volume of carbon storage has an estimated value over $60 billion [18, 22].

Since the volume of wood in Virginia is still increasing, an additional annual average of 5.72 million metric tons of carbon is being stored and 20.98 million metric tons of carbon dioxide are being removed. This is approximately 20 percent of all carbon dioxide emissions produced in Virginia and has an estimated value of over $874 million [23]. These numbers do not include the impact of other forest vegetation or the carbon stored in wood products that are harvested each year. Estimated value for carbon dioxide removal and storage in forest products, such as furniture, housing, and other long-term uses is $195 million annually [18].

Virginia's forests provide over $900 million of air pollution abatement each year. This is based on conservative estimates of what it would cost to remove the same quantities of five major pollutants (carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, and particulate matter) through alternative means. These include only the removal costs and not additional concerns such as health, infrastructure deterioration, and environmental degradation [18, 24].

Improved Quality of Life

Wooded home lots and urban areas have higher values than similar open areas. Several studies have indicated that forested neighborhoods have reduced energy costs, less crime, less pollution, and higher "quality of life" compared to similar communities without trees [25]. Thousands of people are employed in the maintenance, care, and expansion of Virginia's urban and community forests.

According to research, the annual energy conservation value of the trees in Fairfax County in 1995 was over $330 million [26].

The annual economic contributions of Virginia's forestland are shown in Table 6.

As the population of Virginia continues to grow and people and businesses move into more traditional rural areas, the importance of maintaining our forests for all uses will become a greater challenge. It is very important that Virginia not only protects the amount of forestland it has now, but also ensures that sufficient well managed "working forests" are available to provide the products and services we will need in the future.

TABLE 6

ANNUAL BENEFITS

Forest Management	$161 Million
Stumpage	$345 Million
Logging	$864 Million
Primary Processing	$5.30 Billion
Secondary Processing	$5.41 Billion
Indirect Impacts	$2.98 Billion
Construction	$2.82 Billion
Induced Impacts	$7.59 Billion
Specialty Forest Products	$60 Million
Wildlife-Related Recreation	$1.68 Billion
Forest-Related Recreation	$1.34 Billion
Air Pollution Control	$914 Million
Carbon Sequestering	$1.07 Billion
TOTAL	$ 30.53 BILLION

CONCLUSION

From a strong industrial base providing annual economic outputs of $25 billion to a wide-ranging array of forest-related values that contribute an additional $5 billion plus, the forests of Virginia provide over $30 billion in economic output, annually. In addition, our forests satisfy many environmental, social and spiritual needs. Today, Virginia's Forests are healthy and diverse, yet they are constantly changing and their future is threatened by population growth and other socio-economic pressures.

FOREST RESOURCES OF THE COMMONWEALTH:

- Contribute annually over $30 billion to Virginia's Economy.
- Continue to support one of the largest manufacturing industries in the state, ranking first in employment, first in wages and salaries, and accounting for over 12 percent of the value-added in the manufacturing sector.
- Return over $345 million to Virginia landowners for selling timber.
- Provide recreational opportunities to residents and visitors valued at more than $3.0 billion.
- Generate an estimated $60 million through specialty forest products.
- Increase water quality and protect Virginia watersheds from erosion and sedimentation.
- Provide long-term carbon sequestration through forest management of 16 million acres, which contribute to clean air and a high quality of life.
- Provide important social benefits, including attractive sites for homes, scenic beauty, wildlife habitat, a draw for visitors and potential new residents.
- The benefits we derive from Virginia's forests have resulted in a strong economy and enhanced quality of life.

A continued commitment to conserving the forest land base and improving management is needed to maintain these invaluable benefits now and for future generations.

FOOTNOTES

1 Thompson, M.T. and Johnson, T.G. 1994. Virginia's Forests, 1992. USDA Forest Service, Southeastern Forest Experiment Station. Resource Bulletin SE-151.

2 Larson, R. W. and Bryan, M. B. 1959. Virginia's Timber. Forest Survey Release No. 54. USDA, Forest Service. Southern Forest Experiment Station, New Orleans, LA.

3 Commonwealth of Virginia, Governor James S. Gilmore, III. 1998. The Virginia Strategy, Prosperity into the New Century. Commonwealth of Virginia, Richmond, VA.

4 Virginia Forestry Association, Phone Interview, Jim Kuykendall , 6/2000, Richmond, VA.

5 Minnesota Implan Group (MIG) Inc., 1999. Implan Pro Input-Output Model. 1996 Virginia Database, MIG Inc, Stillwater, MN.

6 Virginia Department of Forestry. 1999. Virginia Forest Products Tax Receipts. Charlottesville, VA.

7 Virginia Department of Agricultural and Consumer Services. 1999. Virginia Agricultural Statistics Service. VDACS, Richmond, VA.

8 Smith, R.L.; Reddy, V. and Alderman D. 1998. Wood Waste in Virginia: Its Availability and Current/Potential Markets. VA Tech, School of Forestry and Wildlife Resources, Dept. of Wood Science and Forest Products, Center for Forest Products Marketing.

9 VA Employment Commission. 2000. 1998 Covered Employment and Wages. Virginia Electronic Labor Market Access (VELMA), Commonwealth of Virginia.

10 VA Economic Development Partnership - Employment and Capital Investment in Virginia, 1999 Year-End Report, Richmond, VA.

11 VA Economic Development Partnership - Internal Employment and Capital Investment Summaries, Richmond, VA.

12 VA Department of Agriculture & Consumer Services. 2000. VA Forest Export News, Summer 2000, Richmond, VA.

13 Virginia Department of Forestry Reforestation of Timberlands internal calculations.

14 Birch, T. W. 1997. Private Forest-land Owners of the Southern United States, 1994. USDA Forest Service, Northeastern Experiment Station, Resource Bulletin NE-138.

15 Gardner, W. E. and Stanton W. M. 1995. Before You Sell Your Timber. Woodland Owner Notes. North Carolina Cooperative Extension Service, Raleigh, NC.

16 Virginia Department of Forestry stumpage values internal reports.

17 Virginia Department of Forestry. Personal Interview. July 2000. Donnie Garman. Galax, VA.

18 Virginia Department of Forestry internal calculations.

19 U.S. Department of Interior, Fish and Wildlife Service and U. S. Department of Commerce, Bureau of The Census. 1998. 1996 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, Virginia.

20 Virginia Tourism Corporation. 2000. 1997-98 Virginia Visitor Study. Virginia Tourism Corporation, Richmond, VA.

21 American Forests. 1999. Regional Ecosystem Analysis Chesapeake Bay Region and the Baltimore - Washington Corridor. America Forests, Washington DC.

22 Edmonds, J. et. al. 1999. International Emissions Trading & Global Climate Change, Impacts on the Costs of Greenhouse Gas Mitigation. Pew Center on Global Climate Change. Battelle, Washington, DC.

23 Winebrake, J.J., and Laden, K. 1998. State Greenhouse Gas Emission Inventory for the Commonwealth of Virginia. James Madison University, Integrated Science and Technology Program, Harrisonburg, VA.

24 McPherson, E. G., Nowak, D.J., and Rowntree, R.A. 1994. Chicago's Urban Forest Ecosystem: Results of The Chicago Urban Forest Climate Project. USDA Forest Service, NE Forest Experiment Station. General Technical Report NE - 186.

25 Sullivan, W. C. and Kuo, F. E. 1996. Do Trees Strengthen Urban Communities, Reduce Domestic Violence? USDA Forest Service Southern region, Technology Bulletin No. 4, Forestry Report R8-FR 55, Athens.

26 Knapp M. P. and Jordan A. 1995. Findings of the 1995 Fairfax ReLeaf Urban Forest Benefits Analysis Phase I. Fairfax ReLeaf. Fairfax, VA.

27 Virginia Christmas Tree Growers Association. 1999. VCTGA Newsletter, Winter. Rixeyville, VA.

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