



Blueberry  
*Vaccinium sp.*

## FOREST PRODUCTS

Rhode Island forests provide many products, from logs that will be cut into lumber, to berries that are eaten as fast as they are collected. From an economic standpoint, traditional forest products provide the most to Rhode Island's economy, but firewood and non-timber forest products have very high values for some people.

*'True up the old water mill, hoist the gate, and saw up a little clear stuff. Why is the brook that runs the wheel smaller than it used to be?'*

Jesse B. Mowry, preface to "Forestation in Rhode Island", 1917

### Timber products

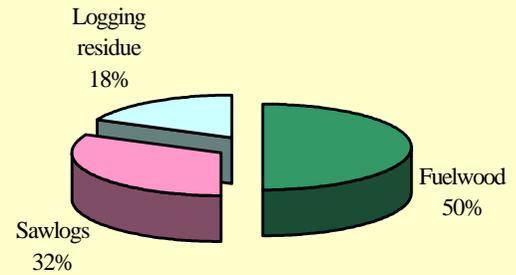
In colonial Rhode Island, timber products included white pine for ship masts, clapboards, and shingles, and oak for casks, barrels, and building material. Many of these products were exported to Europe and the West Indies. Heavy timber harvesting soon took its toll on the forests and local timber shortages began to appear.

Lumber production in Rhode Island peaked around the turn of the 20<sup>th</sup> century with 33 sawmills operating. Soon after, the forest industry began to decline because of a lack of suitable trees and timber production shifting to the Lake States and the southern United States. By 1984, there were 16 mills operating in Rhode Island that produced primarily hardwood pallets, using almost four times as much hardwood as softwood.



A skidder hauling a tree. Once the tree reaches the landing it will be bucked (cut to length) and then hauled to the mill.

Figure 11. Use of trees harvested in Rhode Island



Today when trees are harvested, the high-quality lower trunk is used for lumber, while the upper stem, large branches, small trees, and undesirable species are used for lower value-added products and fuelwood. Parts of the tree that can't be used and have no markets remain in the woods. Sawlogs account for about a third of the volume of trees that are harvested in Rhode Island (Fig. 11). Fuelwood accounts for half of the harvest and the rest is logging residue that is left in the forests.

Sawlogs remain the primary industrial use of wood harvested in Rhode Island. Lumber produced from the Rhode Island's oaks are highly valued and is the basis for more than half of Rhode Island's timber-harvesting activities. By the mid-1980s, almost seven million *board feet*—a board foot is equal to a piece of wood 1 ft by 1 ft square by 1 in thick—of sawlogs were being harvested every year. Almost all of the hardwood sawlogs were harvested from oak species. The volume harvested from the primary softwood species – eastern white pine – reached more than two million board feet per year.

Rhode Island forests have the potential to contribute a much greater amount of wood to the market than is currently being realized. As a result of the forests maturing, there is an abundance of larger trees that, if a buyer is found, would

## Rhode Island's Forest Industries

### Primary processing industries

- Logging
- Sawmill and Planer mills

### Secondary processing industries

- Yacht building
- Lobster traps
- Butcher blocks
- Pallets
- Cabinetry
- Homes

Source: Wood Industry Directory, Southern New England Forest Consortium, Inc.

command a premium price. Fragmentation and parcelization has affected the ability to conduct timber harvests.

The volume of wood in Rhode Island forests increased by 11 percent between 1985 and 1998. The quality of the hardwood resource is high while the quality of the softwoods is much lower. Within the hardwoods, northern red oak has the greatest volume of high value wood in the state. Although timber harvests of high quality eastern white pine in Rhode Island are selling for very good prices, the majority of softwoods are of poor to moderate quality. Insects, such as white pine weevil and hemlock woolly adelgid, are one reason for the poor quality of the softwoods. Although red maple is common in the state, its growth characteristics and wood quality make it undesirable for most commercial uses.



Wood pallets ready to be shipped.

## Fuelwood

Fuelwood is a leading forest product in Rhode Island. The oil embargo of the 1970s and the desire for self-sufficiency by many Rhode Island residents resulted in an increase in residential fuelwood use. While it is not at the levels that it once was, fuelwood remains a significant use today.

Many households in Rhode Island are still dependant, to some extent, on wood for fuel. In 1995, there were more than 126,000 *cord*s of wood—a cord is a stack of split wood 4 ft tall by 4 ft wide by 8 ft long—used for fuelwood, nearly all of which came from hardwood species. About three-fourths of this wood, came from trees not suitable for commercial use because they were dead, decaying, or poorly formed.

## Nontimber forest products

There is an increasing interest in the collection and cultivation of nontimber forest products in Rhode Island and throughout the country. The development of an alternative forest products economy can provide revenue for forest landowners and help people keep their land. Landowner interest in edible and medicinal products, as well as floral industry products, has begun to develop into economic activities that are consistent with a rural character and lifestyle. Currently, witchhazel, ginseng, maple syrup, mushrooms, and floral greenery are cultivated and harvested in Rhode Island. The growth and enhancement of businesses based on non-timber forest products can meet changing landowner and community needs and provide money to help landowners maintain healthy, sustainable forests.



Fuelwood still provides the principal heating source for some Rhode Islander's homes



There is an increasing interest among private landowners in non-timber forest products such as witch hazel.

## WILDLIFE

Many species of wildlife depend on forested habitats for their survival. From white-tailed deer to migratory warblers, Rhode Island's forests are home to a wide diversity of wildlife. The streams and ponds that the forests protect are critical to many species, as well as a home to an equally diverse group of aquatic wildlife. The diversity and abundance of all of this wildlife changes as the distribution, composition, and structure of the forests change. The major trends that are affecting wildlife are the maturing/aging of the forest resource, a proliferation of poor quality *edge habitat*, and a lack of young forests.

As a result of these conditions, the number and variety of wildlife species currently found in Rhode Island has been changing in unanticipated ways. It is increasingly common to find animals that were once considered unthinkable here, including moose, black bears, and fishers. Many of these animals are transient visitors, but their sightings are becoming increasingly common.

In addition to wildlife that are naturally immigrating into the state, wildlife biologists are introducing other species. Reintroduction of once native species, such as wild turkey, has proved very successful because these animals are well suited to the habitats that Rhode Island has to offer. But attempts to introduce some species, particularly game birds like ring-necked pheasant, have been less successful. The limited area of agricultural fields and other grasslands in which to feed and breed and an abundance of predators have been the main reasons why game birds have not been able to establish self-sustaining populations.

The aging and maturation of our forests in the past 10-20 years has resulted in a

forest that is relatively uniform in composition and structure. One advantage of the mature forest is the large amount of mast—nuts and fruit—produced by some of the more common Rhode Island trees, such as the oaks. But mast production varies greatly from year to year and wildlife can not live by mast alone. In addition, mature forests provide more snags—standing dead trees—and fallen trees that provide habitat for cavity-nesting animals and other animals that need dead wood.

The proliferation of edge habitat – the interface between different habitat types or age classes – between forest and non-forest land uses has helped a limited number of wildlife species proliferate. In particular, species such as white-tailed deer and wild turkey are able to exploit these habitats and their numbers have increased dramatically over the last 100 years.

Though there is now an abundance of forest/nonforest edge habitat, there is a general lack of high quality edge habitat that will significantly increase wildlife diversity. To increase wildlife diversity, we need a greater diversity of habitat types and age classes.



A young white-tailed deer or fawn

### Managing Forests for Wildlife

As the diversity of the forest increases, usually the diversity of the wildlife increases. The absence of large-scale disturbances - such as fires, hurricanes, and timber harvests - means forest diversity will be lowered because of a lack of young forests and meadows. The continuing maturation of the forest and the lack of regenerating forest will continue to favor wildlife, such as white-tailed deer and raccoons, and does little for other wildlife, such as bluebirds and cedar waxwings.

Today, only a small percentage of the Rhode Island forest is actively managed, and of this amount, lesser still is managed specifically to provide wildlife habitat. Through their use of fire, Native Americans were the first to intentionally influence the composition and structure Rhode Island forests. Widespread use of fire as a means of forest management would not be tolerated today. But with sound, proactive management that may include prescribed burns and timber harvesting, Rhode Island forests can yield a rich diversity of habitat beneficial not only for wildlife but also beneficial for watershed protection, aesthetics, and a full range of timber and nontimber forest products.



Urban forest and other land uses in southeastern Rhode Island

## URBAN FORESTS

Rhode Island is one of the most urbanized states in the United States. *Urban forests*—trees and associated plants and animals in and around cities and towns—provide one of the few direct links between urban residents and nature. Trees not only provide mental solace, but they also physically enhance cities and towns by lowering summer temperatures and helping to clean the air and water.

Urban forest land is the only category of forest land to have actually increased in recent years from 1 percent of the forest land base in 1985 and to 5 percent in 1998. Urban forests differ from rural forests because growth and development of trees are limited by city structures rather than natural forest processes. Urban forestry involves the growth, management, and care of trees of these forests.

Until recently, a plan for urban forestry was viewed as unnecessary. Up until about 30 years ago, the majority of Rhode Islanders lived tightly packed together in the major industrial cities of

the state. The cities of Rhode Island's past, while gritty, were also green. But hurricanes and Dutch Elm disease changed the look of the cities by killing many stately trees. Another phenomenon changing urban forests was the countless numbers of yard trees being cut to provide space for off-street parking, garages, patios, pools, decks, and other manifestations of our rising affluence. Street widening and utility projects caused further tree loss.

Coincidentally, as the trees were disappearing from our cities, so were the people. Development surged outward from the state's urban centers into surrounding suburbs and small villages, also impacting community tree resources. Today, low-density residential development continues to proliferate in rural areas throughout the state. Trees continue to be cut and land cleared to accommodate fleeing urbanites seeking home sites in rural, wooded settings, often unaware that their individual location decisions risk the very environmental features and rural charm that lured them there.

### The Rhode Island Urban and Community Forest Plan

In 1999 the Rhode Island Department of Environmental Management, Division of Forest Environment, and the Rhode Island Tree Council established the Rhode Island Urban and Community forest plan. The aim of this plan is to improve urban and community forest resources by influencing decisionmaking processes. The plan does not mandate any particular action, but rather seeks to foster recognition and offer options and tools. An underlying assumption of this is that, with careful planning, quality designs, proper management, and prudent investment, urban and community forests can be maintained and improved without negatively impacting economic growth.

To guarantee that vibrant and productive urban and community forests are a component of Rhode Island's future landscape, and to maximize the benefits that urban and community forests provide as green infrastructure, the State will seek to stabilize overall forest cover at or near the present level, and gradually improve the urban forests. Other recommendations are:

- Seek a higher profile for the protection and management of urban and community forest resources in public and private community planning, development, capital investment, and infrastructure management decisions
- Increase public awareness of the benefits provided by urban forests
- Protect trees of environmental and cultural importance through educational and/or legal means
- Monitor the status of Rhode Island's urban and community forest resources
- Encourage new development that respects forest resources as vital elements of the community and properly integrates trees to create high-quality living and working environments
- Maximize the impact of tree planting using trees appropriate to site conditions—"the right tree for the right place"
- Encourage a high level of maintenance of community green infrastructure through adopted standards and adequate funding
- Involve the public and the private sector in efforts to plant and maintain community tree resources, including public trees

# THE FUTURE

During the 20<sup>th</sup> century, mankind has witnessed the birth of a new land ethic born from a landscape devastated by forest exploitation. We also have witnessed the power and resilience of nature as the landscape healed and forests again became our sanctuary. What will the future bring and how will Rhode Island's forests fair in the decades ahead?

We are confident that forests in the public sector will continue to grow. Land trusts, non-profit organizations, and governments have been actively pursuing protection strategies that will stretch well into the 21<sup>st</sup> century. Conservation easements will allow lands to remain in private ownership and protect critical habitats while providing a mechanism for continued forest use. While total forest cover will shrink because of the pressures of fragmentation and parcelization, there should be a significant pool of willing landowners who will protect and manage private forests. The percentage of publicly owned forest will increase, but government cannot and should not own it all. Today 75 percent of the forested landscape is in private hands and the sheer number of decisionmakers allow for a rich diversity of management styles. We need to educate these landowners.

Industry needs to continue to adapt and we predict they will. Smaller lot sizes mean industry must use smaller, environmentally friendly equipment. Alternative nontimber forest products will gain in popularity.

The forest will continue to slowly convert to eastern white pine in southern Rhode Island where soils are sandy while northern Rhode Island should continue to see a thriving hardwood forest. Within the next two decades, the trees planted by the Civilian Conservation Corps prior to World War II will be gone and almost all of Rhode Island's forest will be the result of natural regeneration. Average volume per acre will continue to climb and standing volume should exceed 2 billion board feet by 2020.

Forest fires will play a minor role in the Rhode Island landscape; however, a drought period that coincides with the spring fire season could prove especially problematic. Rhode Island's older forest will tend to burn less as long as it stays healthy. Human development within the forest will result in an increased risk of fire starts although those fires should stay small.

First and foremost, the forest will be our playground. People will continue to use our forested landscape for recreational purposes and the public's primary interest will be vested in specific uses enjoyed by the recreating public.

Attention to the urban forest will accelerate our understanding of how trees benefit society. Programs designed to build, maintain, and enhance the urban forest will grow as will community commitments to protect the urban-suburban forests. A regard for trees as a valued element of the urban infrastructure will grow, resulting in a better managed resource that will improve the aesthetics and livability of our cities and towns.

Insect and disease problems will continue to impact our forests. Hemlock might disappear and insects associated with southern climates might play important roles in changing our forests. The forest health monitoring and management strategies will adapt to the challenges that will include invasive, non-native pests, dramatic weather events, and political and social change.

The public value of forest management will grow as our society continues to learn and understand the integral role our forest lands play in the protection of our water resources. The forest's intrinsic tie to abundant clean water will lead to greater protection, preservation, and management of forest tracts. It is in forest management that options for future generations are preserved while present goals and needs are met.

In the future, Ralph Waldo Emerson's words should still ring true: "In the woods we return to reason and faith."

# GLOSSARY

- Board foot—equal to a piece of wood 1 ft by 1 ft square by 1 in thick  
Cord—a stack of split wood 4 ft tall by 4 ft wide by 8 ft long  
Edge habitat—the interface between two types of land uses, such as forest and nonforest, or age classes  
Hardwoods—a group of tree species that are generally broad-leaved and deciduous  
Forest land—land that is at least 1 acre in size and is at least 10 percent stocked with trees or that formerly had such tree cover and is not currently developed for a nonforest use  
Forest composition—the number and diversity of tree species within a forest  
Forest structure—the physical attributes of a forest  
Forest type—a classification of forest land based upon the dominant trees in a stand  
Fragmentation—the division of contiguous or adjoining forestland into smaller or more complex patches  
Parcelization—the division of forest land owned by a single ownership into parcels owned by more than one ownership  
Softwoods—a group of tree species that are generally evergreen and have needle shaped leaves  
Stand—a group of forest trees growing on forest land  
Timberland—forest land capable of growing trees that can be used for forest products  
Urban forest—trees and associated plants and animals in and around cities and towns

## RHODE ISLAND TREES - COMMON AND SCIENTIFIC NAMES

### Softwoods (Conifers)

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Eastern redcedar	<i>Juniperus virginiana</i>	Eastern white pine	<i>Pinus strobus</i>
Tamarack	<i>Larix laricina</i>	Scotch pine	<i>Pinus sylvestris</i>
Red pine	<i>Pinus resinosa</i>	Eastern hemlock	<i>Tsuga canadensis</i>
Pitch pine	<i>Pinus rigida</i>		

### Hardwoods (Deciduous trees)

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Red maple	<i>Acer rubrum</i>	Apple	<i>Malus sp.</i>
Sugar maple	<i>Acer saccharum</i>	Blackgum	<i>Nyssa sylvatica</i>
Serviceberry	<i>Amelanchier sp.</i>	Eastern hophornbeam	<i>Ostrya virginiana</i>
Yellow birch	<i>Betula alleghaniensis</i>	Eastern cottonwood	<i>Populus deltoides</i>
Sweet birch	<i>Betula lenta</i>	Bigtooth aspen	<i>Populus grandidentata</i>
Paper birch	<i>Betula papyrifera</i>	Black cherry	<i>Prunus serotina</i>
Gray birch	<i>Betula populifolia</i>	White oak	<i>Quercus alba</i>
American hornbeam	<i>Carpinus caroliniana</i>	Swamp white oak	<i>Quercus bicolor</i>
Bitternut hickory	<i>Carya cordiformis</i>	Scarlet oak	<i>Quercus coccinea</i>
Pignut hickory	<i>Carya glabra</i>	Chestnut oak	<i>Quercus prinus</i>
Shagbark hickory	<i>Carya ovata</i>	Northern red oak	<i>Quercus rubra</i>
Flowering dogwood	<i>Cornus florida</i>	Black oak	<i>Quercus velutina</i>
American beech	<i>Fagus grandifolia</i>	Black locust	<i>Robinia psuedoacacia</i>
White ash	<i>Fraxinus americana</i>	Willow	<i>Salix sp.</i>
Black ash	<i>Fraxinus nigra</i>	Sassafras	<i>Sassafras albidum</i>
Green ash	<i>Fraxinus pennsylvanica</i>	American elm	<i>Ulmus americana</i>
Black walnut	<i>Juglans nigra</i>	Slippery elm	<i>Ulmus rubra</i>
Yellow-poplar	<i>Liriodendron tulipifera</i>		

## FOREST AMENITIES

Most Rhode Islanders get financial gains from their forest lands only when they sell their property. But forests generate many benefits that cannot be quantified in terms of dollars and cents. From purifying the air and water, to providing a place for recreation and a setting for residential properties, the forests are vital to the health, welfare, and well-being of the people of Rhode Island.

### Water and climate

The most important role forests play is in the regulation of climate and water cycles. Over the course of millennia, trees and other green plants have changed the atmosphere. Through photosynthesis, trees combine carbon dioxide and water using the sun's energy to produce sugars. These sugars form the base of the food chain. A byproduct of photosynthesis is oxygen; without photosynthesis there would be too little oxygen for us to breath. Trees also help control the temperature of the atmosphere by removing carbon dioxide a greenhouse gas that helps trap warmth in the atmosphere. Many environmentalists are looking at forests to help offset our carbon dioxide emissions and mitigate global warming.

Forests are vital for clean, dependable

flows of water. More than 600,000 Rhode Island residents depend on reservoirs for their water supply with the remainder of the residents relying on wells. The reservoirs are surrounded by forest because the reservoir managers know the importance of forests for maintaining water quality. By allowing water to slowly infiltrate into the ground, clean water enters streams and aquifers and is then available for extraction by homeowners and businesses. Once forests are removed, rain can cause soil erosion that depletes soil fertility, and muddies streams and ponds, thus decreasing water quality.

### Recreation

From the shores to the rolling hills, forests create and help frame the beautiful landscape that Rhode Islanders have come to expect. The people of Rhode Island have a long history of recreating in the forests.

The first Rhode Islanders hunted and fished in the forests to provide sustenance for themselves and their families. Hunting and fishing are still common pastimes, but are now done more for pleasure than out of necessity. There are many acres of public and private lands in the state that are used primarily for hunting and fishing.

But there are a plethora of other activities that Rhode Islanders pursue in the woods. Many miles of trails and forest roads are used by hikers and horseback riders. And nearly every Rhode Islander has appreciated the beauty of the forest during the first flush of green in the spring or the explosion of color in the fall.



Sugar maple  
*Acer saccharum*

*“The returns from forestry are too obvious for discussion. The beauty and glory of the earth as the home of man depends upon the forest. It is the business of forestry to develop and perpetuate the forest that it shall serve forever in the highest degree the manifold interests of humanity.”*

- Jesse B. Mowry, 1913



Pulaski Pond, George Washington Management Area

## WANT MORE INFORMATION?

### On the internet

State of Rhode Island Department of Environmental Management	<a href="http://www.state.ri.us/dem/">http://www.state.ri.us/dem/</a>
USDA Forest Service Northeastern Research Station FIA State and Private Forestry	<a href="http://www.fs.fed.us/ne/">http://www.fs.fed.us/ne/</a> <a href="http://www.na.fs.fed.us/">http://www.na.fs.fed.us/</a>
Southern New England Forest Consortium	<a href="http://www.snefci.org/">http://www.snefci.org/</a>
Rhode Island Forest Conservators Organization	<a href="http://www.rifco.org">http://www.rifco.org</a>
Rhode Island Tree Council	<a href="http://www.ritree.org">http://www.ritree.org</a>

### Rhode Island forest statistics publications

- Forest Statistics for Rhode Island: 1985 and 1998 by Carol L. Alerich (2000), published by U.S. Department of Agriculture, Forest Service, Northeastern Research Station, Resource Bulletin NE-149.
- Forest Statistics for Rhode Island-1972 and 1985 by D. R. Dickson and Carol L. McAfee (1988), published by U.S. Department of Agriculture, Forest Service, Northeastern Research Station, Resource Bulletin NE-104.
- Forest Statistics for Rhode Island by John R. Peters and T. M. Bowers (1977), published by U.S. Department of Agriculture, Forest Service, Northeastern Research Station, Resource Bulletin NE-49.
- FIA Photointerpretation in Southern New England: A Tool to Determine Forest Fragmentation and Proximity to Human Development by Rachel Reimann and Kathy Tilman (1999), published by U.S. Department of Agriculture, Forest Service, Northeastern Research Station, Research Paper NE-709.
- Private forest-land owners of the Northern United States, 1994 by Thomas Birch (1996), published by U. S. Department of Agriculture, Forest Service, Northeastern Research Station, Resource Bulletin NE-136.

### Other books that may be of interest

- Working with your woodland: A landowner's guide by M. Beattie, C. Thompson and L. Levine (1993), published by the University of New England Press.
- A Sierra Club Naturalist's Guide to Southern New England by Neil Jorgensen (1978), published by Sierra Club Books.
- New England Wildlife: Management of Forested Habitats by Richard M. DeGraff and others (1992), published by the U.S. Department of Agriculture, Forest Service, Northeastern Research Station., General Technical Report NE-144
- Changes in the Land: Indians, Colonists, and the Ecology of New England by William Cronon (1983), published by Hill and Wang.
- Reading the Forested Landscape: A Natural History of New England by T. Wessels (1997), published by Countryman Press.

## STILL HAVE QUESTIONS?

### Please contact:

USDA Forest Service Forest Inventory and Analysis 11 Campus Boulevard, Suite 200 Newtown Square, Pennsylvania 19073 (610) 557-4075	or	Rhode Island Department of Environmental Management Division of Forest Environment 1037 Hartford Pike North Scituate, Rhode Island 02857 (401) 647-4389
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U.S. Department of Agriculture, Forest Service  
Northeastern Research Station  
11 Campus Boulevard, Suite 200  
Newtown Square, Pennsylvania 19073-3294

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