

The Forests of Rhode Island



United States
Department of
Agriculture



Forest Service

Northeastern Research Station
NE-INF-155-02
September 2002

In cooperation with:



Rhode Island Department of Environmental Management
Division of Forest Environment



The Forests of Rhode Island

EDITED BY Brett J. Butler and Eric H. Wharton

CONTRIBUTING AUTHORS:

- Charles J. Barnett, USDA Forest Service
- Brett J. Butler, USDA Forest Service
- Paul Dolan, Rhode Island DEM
- Thomas A. Dupree, Rhode Island DEM
- Marla Emery, USDA Forest Service
- Andrew Lister, USDA Forest Service
- Tonya W. Lister, USDA Forest Service
- Paul Ricard, Rhode Island DEM
- Catherine Sparks, Rhode Island DEM
- Eric H. Wharton, USDA Forest Service
- Richard H. Widmann, USDA Forest Service

FUNDING for this report was provided by the USDA Forest Service, Northeastern Research Station, Forest Inventory and Analysis program in cooperation with the Rhode Island Department of Environmental Management, Division of Forest Environments.

THANKS TO Carol Alerich for assistance with data compilation and interpretation, Jay Aron for sharing his insights and expertise, Ted Drozdz and the Rhode Island Airport Corporation, Department of Aeronautics for providing a unique view of Rhode Island forests, and Tom Abbott, Hans Bergey, Chris Modisette and Marc Tremblay for comments on earlier drafts of this booklet.

PHOTOGRAPHY CREDITS:

Front and back cover: Brett J. Butler, USDA Forest Service
Page 3, red maple: Kenneth M. Gale, Mosaic Tile Co.,
<http://www.forestryimages.org/>
Page 10, northern red oak: Paul Wray, Iowa State University, <http://www.forestryimages.org/>
Page 12, white oak: Paul Wray, Iowa State University,
<http://www.forestryimages.org/>
Page 16, gypsy moth larvae: USDA APHIS PPQ Archives,
USDA APHIS PPQ, <http://www.forestryimages.org/>
Page 16, hemlock woolly adelgid: Michael Montgomery,
USDA Forest Service
Page 21: USDA Forest Service Archives, USDA Forest
Service, <http://www.forestryimages.org/>
All other photographs: USDA Forest Service

FRONT COVER: View from Wickaboxet Rock, Wickaboxet Wildlife Management Area.

BACK COVER: Sunset over Bowdish Reservoir, George Washington Management Area.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

PREFACE

In his first annual report to the Rhode Island General Assembly in 1907, Jesse B. Mowry, Rhode Island's first State Forester, penned the following:

It is a fact well known to most of you that the timber which once covered our hillsides, ameliorating our climate, beautifying the landscape, protecting the watersheds, and constituting one of the most valuable natural resources of the state, has now nearly all disappeared before the woodsman's axe. It follows, therefore, that the protection and rapid growth of the succession of sprout and seedlings is a problem of interest and importance to the people.

These statements mirror earlier statements from Bernard Fernow, Chief of the U.S. Division of Forestry (now known as the USDA Forest Service) who in 1887 noted:

Forests in the strict sense of the word can hardly be said to exist in this state (Rhode Island), although 24 percent is reported covered with wood, mostly coppice and white pine and pitch pine, which here and there may be said to rise to the dignity of forests.

These words imply that forest sustainability was not in the hearts and minds of the citizens. It would take a government effort focused on improving the forest condition, to bring about change. Mowry was a true visionary, setting the stage for forestry efforts through the 20th century. He understood the value of forests and how those forests connect to other critical resources. Mowry wanted to change public attitudes and rehabilitate the landscape.

Now, at the turn of the 21st century, Mowry would be impressed. The state has maintained an active forestry effort which he pioneered, and, through the 20th century, his seminal ideas have born fruit. Forest land in Rhode Island covers 59 percent of the land and has matured beyond a point thought possible by early foresters. The volume of wood in the Rhode Island forest has increased almost eightfold over the past 50. Equally important is the return of forest-dwelling animals that disappeared from the landscape centuries ago. Deer, coyote, fisher, beaver, wild turkey, and even bears are now found throughout the state.

While this report highlights a success story, it also emphasizes a need to continue forestry efforts. As in earlier times, we stand to lose our forests as pressures of urban sprawl and unchecked development surpass the pioneers' efforts to clear the landscape for agriculture. Unlike the agrarian landscapes of the past, shopping malls, suburban neighborhoods, and highways will not provide opportunity for forest regeneration. Consequently, forestry interests must work towards improving the planning scenarios within communities and fostering business opportunities through sustainable forestry activities. We need to forge new cooperative partnerships in future decades if we wish to maintain our healthy forest capital.

Mowry also had strong opinions on "cooperation." As he was closing out his career, Mowry wrote in 1924 :

Cooperation has become a favorite catchword so incessantly stressed these days that one is led to inquire where in the boundless maze of sociological therapy the limitations of its worth may be set.

He entrusts to the reader the following philosophy that today is the most critical tool for forestry organizations:

It is desirable for various interested organizations to assist the forestry department, particularly in the wide distribution of the most useful information on forestry, so far as different organizations can work together without too much friction and duplication. Their efforts, in order to be guided in right directions, should be correlated under the leadership of the forestry department.

We need to maintain our focus on the forests of this state now more than ever. We need to enlist true partners and work cooperatively to manage, sustain, and wisely use this critical resource.



Thomas A. Dupree, State Forester
Rhode Island Department of Environmental Management
Division of Forest Environment

EXECUTIVE SUMMARY

- This report summarizes a 1998 inventory of the forests resources of Rhode Island.
- In 1998, forests covered 393,000 acres, or 59 percent, of the land in Rhode Island. This is a decrease from 1985 when there were 411,800 acres of forest. Historically, the forest cover has ranged from more than 90 percent prior to European colonization to around 25 percent at the height of agriculture in the mid-1800s.
- Since the 1960s, Rhode Island has been losing forest area. The only exception is that the area of urban forest land has been increasing. Not only has the area of forest land been decreasing, but the forest that remains is fragmented, or increasingly being divided into unconnected blocks. In addition to the land becoming more fragmented, the 75 percent of the forest land that is privately owned is becoming increasingly parcelized. The average parcel of forest land decreased from 26 acres per private landowner in 1973 to 13 acres in 1993.
- The major forest type in Rhode Island is oak/hickory. The next most common forest types are maple/ash, maple/birch, and oak/pine. The 10 most common trees in that state are red maple, eastern white pine, scarlet oak, white oak, northern red oak, yellow birch, black oak, sweet birch, black gum, and black cherry.
- The area of the oak/hickory forest type has been diminishing during the past 25 years as the areas of maple/birch and oak/pine have been expanding. At the same time, the forests lack structural and compositional diversity with most of the forest in the state being around 60 years old. In the past, natural disturbances and forest management have fostered diversity.
- Native insects and diseases are a normal part of healthy forests, but the introduction of foreign insects and diseases can have devastating effects on forests. During the past 100 years, the forests of Rhode Island have been impacted by gypsy moth, chestnut blight, Dutch elm disease, and more recently, hemlock woolly adelgid.
- The forests provide important benefits to Rhode Island citizens. Rural and urban residents appreciate the scenery that forests provide. Although forests provide important benefits like recreational opportunities and wildlife habitat, one of the most important roles is the supply of clean and copious water. The forests also supply timber products, firewood, and non-timber forest products, such as witch hazel and floral greenery.
- At the turn of the 21st century, the greatest threat to sustaining healthy forests in Rhode Island is the expansion of urban and suburban areas. In the coming years, the role of forests in protecting water supplies, as places to recreate, and as components of urban environments will be increasingly important. Education of the public and landowners and sound forest management are keys to sustaining the forest. To ease the expense of forest management, it is important that markets exist for timber and nontimber products.

INTRODUCTION

Forests cover 3 out of every 5 acres of Rhode Island. These lands provide citizens with scenic backdrops for recreation and homes, a clean and perpetual supply of water, wildlife habitat, fuelwood, and timber and nontimber forest products.

But these forests are always changing! Spend a day in a Rhode Island forest and different sights and sounds will greet you at night, dawn, day, and dusk. The effects of the seasons emerge after watching the forests for a year – leaves bloom and decay and birds and other woodland creatures come and go. Observe the forest for a decade and trees will grow, trees will die, and maybe the forest will change altogether.

Understanding the changing nature of Rhode Island forests requires timely and unbiased information about this important resource. To fulfill this need for information, the USDA Forest Service initiated the Forest Inventory and Analysis program to systematically inventory forests throughout the United States. In 1998, the Forest Service's Northeastern Research Station in cooperation with the Rhode Island Department of Environmental Management, Division of

Forest Environment, completed an inventory of Rhode Island forests. This report summarizes the findings of this and previous inventories conducted in the state and examines the underlying factors of the major changes.

The Forest Service could not count every tree in Rhode Island. Instead, it used a scientifically designed sampling method. First, aerial photographs for the state were studied. On these photos a grid of more than 2,000 points was overlaid. For each point, land use and, if forested, size of trees were determined. From this information, a sample of 103 plots representative of all of the state's forested areas was selected for measurement by field crews. More than 80 percent of these plots were remeasured from the previous survey conducted in 1985. By remeasuring plots, data were obtained on the growth of individual trees. Some plots were first established in 1952 and were measured for the fourth time during this inventory. Field crews collected information on the number, size, and species of trees, as well as other forest attributes. From the data, estimates were made of the forest resource – its condition, health, and changes over time.



Red maple (fall colors)
Acer rubrum

Red maple is Rhode Island's state tree



Forest Inventory and Analysis personnel collecting field data.

THE HISTORY OF RHODE ISLAND FORESTS



Eastern White Pine
Pinus strobus

When the first people arrived in Rhode Island more than 10,000 years ago, they encountered a climate that was much colder than today and a landscape that had recently been covered by massive sheets of ice. The forests that developed subsequent to these conditions resembled the spruce and fir forests that now occupy northern New England and southern Canada. As the climate warmed, the forests slowly evolved into what we see today. The changing forests have influenced the people who live in and nearby it, and in turn, the people have influenced the changes of the forest.

The Native Americans of Rhode Island – the Narragansett and Wampanoag and parts of the Nipmuc, Pequot, and Niantic tribes – were mobile people who followed the bounties of the land and water through the seasons. During the spring and summer months, they frequented the shores of the bays and rivers catching fish and shellfish. The forests were their homes beginning with the hunting of game in the fall through the lean winter months. Along with a source of game, forests also provided

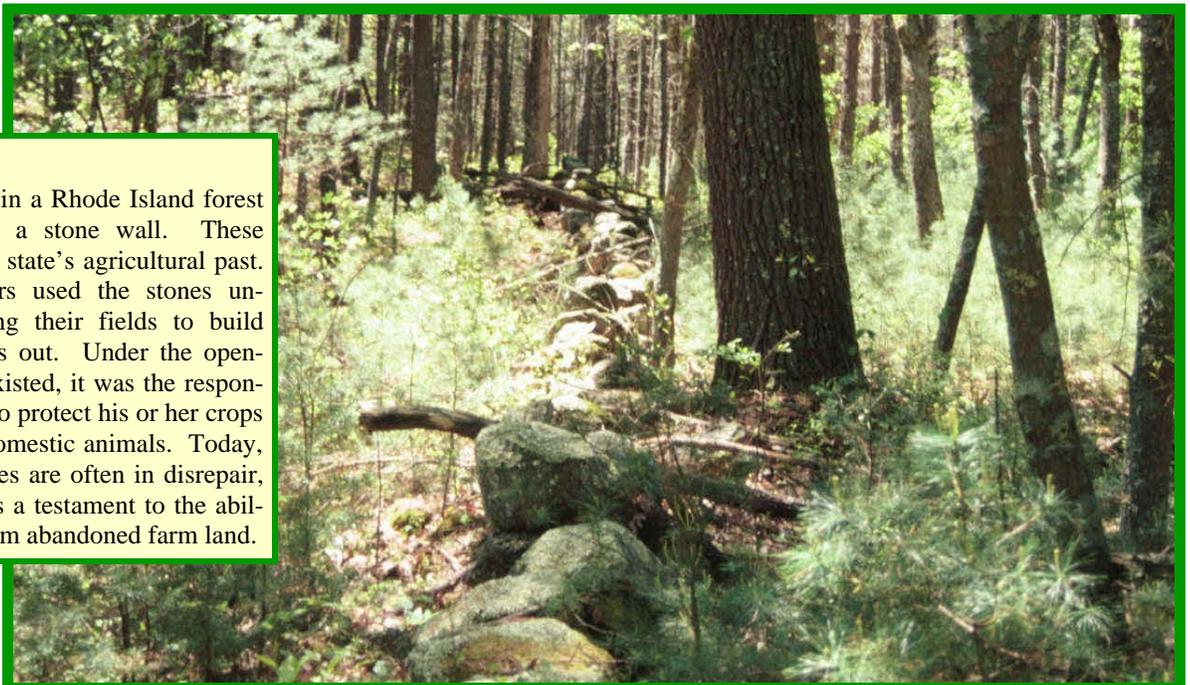
foodstuffs such as acorns and chestnuts, raw materials for canoes and houses, and fuelwood to stave off the cold and to cook.

These people intentionally changed the forests by using fire to both enhance and clear the forest. Ground fires were set as often as twice a year to clear underbrush and facilitate hunting and travel. This practice resulted in the park-like forests encountered by the early European colonists. To clear land for planting maize, beans, and squash, fire also was used to girdle trees. In the shadows of these standing dead trees or snags, crops were planted until the soil lost its fertility. Then the land would be abandoned and the sequence would be repeated elsewhere.

Beginning in the 17th century, Roger Williams and other European descendants began to colonize Rhode Island. The religiously tolerant early settlers lived in harmony with the Native Americans, and until King Philip's War, the Native Americans in Rhode Island were spared many of the travesties inflicted on other tribes. But one set of

Stone Walls

It is difficult to walk in a Rhode Island forest without encountering a stone wall. These walls are relics of the state's agricultural past. For centuries, farmers used the stones unearthed while plowing their fields to build walls to keep animals out. Under the open-pasture system that existed, it was the responsibility of the farmer to protect his or her crops from both wild and domestic animals. Today, these abandoned fences are often in disrepair, but their abundance is a testament to the ability of a forest to reclaim abandoned farm land.



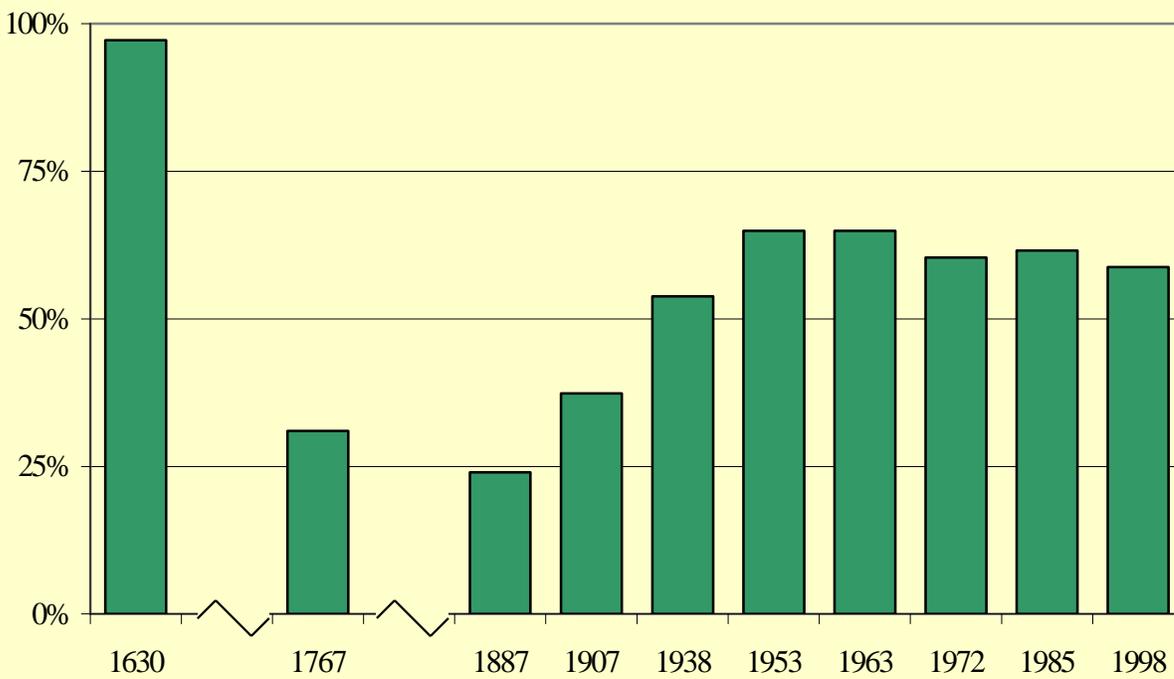


Figure 1. Percentage of land that was forested in Rhode Island in 1630, 1767, and between 1887 and 1998.

travesties that could not be avoided by goodwill was the diseases of European origins that devastated many Native American villages, often killing 80 to 90 percent of the inhabitants.

The early colonists lived similarly to the Native Americans – relying heavily on fish for sustenance, growing the same crops, and depending on the forest for shelter and warmth. One major difference was that the Native Americans were mobile while the colonists followed the European tradition of settling on a fixed parcel of land and assigning to individuals exclusive rights to use that land and all its bounties. The more intensive land use by the colonist resulted in more forest area being cleared and brought under cultivation with much of the remaining forest used as pasture and as a supply of fuelwood and building supplies.

The Native Americans’ winter villages were determined by, among other things, the availability of firewood. Colonists and their descendents lived in fixed locations and had to continually venture further for the necessities that the forest provided. Close to farms and villages selective harvesting practices modified the forest with oak, chestnut,

and hickory trees preferentially harvested. The forest dwindled to about a quarter of the state’s area prior to the Industrial Revolution just as another important forest function became apparent – water. Rhode Island’s streams and rivers began to silt up resulting in the rivers alternating between flooding and running dry. Some species of wildlife began to disappear with few deer remaining by the mid-1800s.

The Industrial Revolution brought significant changes to all New England: people migrated to the cities, food was increasingly imported from the Midwest, and relationships with the land were profoundly changed. As the farms were abandoned, the forests began to grow again. In 1938, a destructive hurricane was followed by widespread forest fires destroying many of the trees in these “old-field” forests. The forests that regrew compromise much of what we see today. But these forests are very different than those observed by the first colonists. Due to selective harvesting practices, invasions of forests diseases and pests, and changes in forest fire practices, important components of the presettlement forest have changed or disappeared.

Selected Native American Words for Forest Foodstuffs

<i>Wenomeneash</i>	Grapes
<i>Wompimineash</i>	Chestnuts
<i>Anauchemineash</i>	Acorns
<i>Wusswaaquatomeug</i>	Walnuts
<i>Sasaunckapamuck</i>	Sassafras
<i>Qussuckomineanug</i>	Cherry
<i>Wuttahimneash</i>	Strawberries
<i>Wuchipoquameneash</i>	Barbary
<i>Sautaash</i>	Currants

Source: A Key into the Language of America by Roger Williams (1643) published by the Rhode Island Antiquarian Society, Providence Plantations Tercentenary Committee, Inc., Providence.