

*DEEP FORESTRY DIVISION*

# Why We Manage Connecticut State Forests

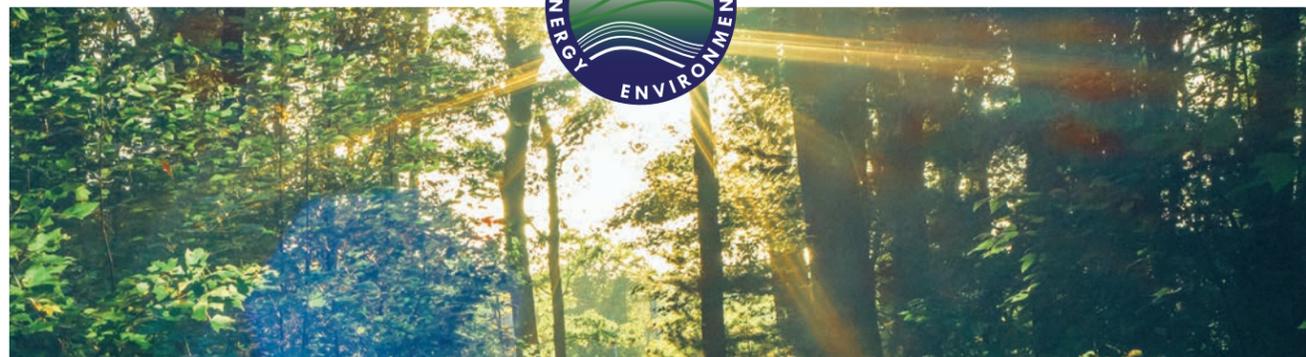


# State Forester Message

*“The Department of Energy and Environmental Protection (DEEP) manages approximately 175,000 acres of agency state forests held in public trust. These forests offer a variety of ecosystem services and public benefits including providing habitat for many different wildlife species, sequestering and storing atmospheric carbon on site and in long-lived forest products, safeguarding of public drinking water supplies, and outdoor recreational opportunities.*

*The Forestry Division’s mission is to enhance these attributes through purposeful forest health and wildlife habitat interventions. Designed to sustain diverse and resilient tree cover, these management techniques result in a forest better equipped to withstand and respond to invasive plants, damaging insects, diseases, and extraordinary weather events. Connecticut’s woodlands cross many ownerships; state, municipal, and private, and are constantly changing. Some changes are planned; others not.*

- Christopher R. Martin



## DEEP and the Forestry Division

Provides services to meet the needs of Connecticut’s residents including forest products, forest fire protection, forest health, public land management, private lands forestry, urban forestry, forest practitioner certification, landscape level planning, and enforcement of state statutes.

# Forestry Division Vision Statement

The Connecticut Department of Energy and Environmental Protection (DEEP) Forestry Division’s objective is to promote healthy and diverse forest ecosystems. Forests enhance water and air quality, while providing habitats for native species that are threatened or endangered. Our forests also offer recreational opportunities, a sustainable source of wood products used locally and around the world, and carbon sequestration and storage.



### Conserve

Natural landscapes and resources significant to Connecticut



### Manage

Forests by using best available science-based methods and techniques



### Protect

From fire, theft, exotic plants and insects, disease, and illegal/abusive practices



### Research

Past, current, and emerging forest issues in collaboration with partner organizations



### Provide

Valuable ecosystem services and renewable natural resources



### Educate

Connecticut residents on the importance of forest management

# The Shaping of Connecticut's State Forests



## Post-Glacial Retreat

Glacial retreat left a barren landscape, which would become the foundation of our forests. Over time, pioneer species began to occupy this space, and primary succession became the driving force shaping Connecticut forests.

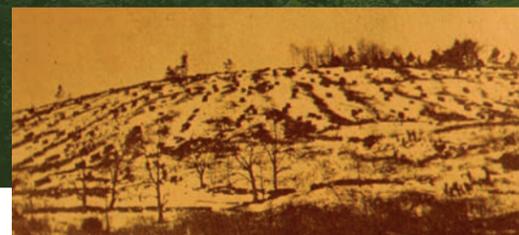
15,000 YEARS AGO



## Native Americans

The Pequots and Mohegans migrated from New York to Connecticut, strategically burning forests to improve game habitat; increase berry, acorn, and firewood production; allow for easier travel and hunting; and clear land for agriculture, all before the first landing of the Europeans.

12,000 YEARS AGO — 1600s



## European Settlement

The Dutch were the first Europeans to arrive in 1614. After decades of conflict, Native Americans were displaced and lands were transferred to colonial governments. Landscape changes rapidly became drastic as settlers cleared the land for their farms.

1600s — 1700s



## Industry & Development

Settlers continued clearing the forests until nearly 80% was transformed for agricultural and charcoal industries. It wasn't until the late 1800s when farmers began to abandon their farms for employment in cities and better farmland in the midwest that the forest began to reclaim the countryside.

LATE 1700s — 1800s

1800s



## Origins of Forestry in CT

The Connecticut Forestry Association was formed in 1896 in response to widespread forest clearing, diminished game populations, and large wildfires. They advocated for the appreciation, protection, acquisition, management, and study of forests.



## Establishment of State Forests

In 1901, Connecticut appointed the first State Forester. In 1903, the State acquired its first tract of forest land. By 1921, five state forests were acquired, totaling 4,452 acres.

EARLY 1900s



## Formation of DEEP

In 1905, the State Forester was appointed the Statewide Forest Fire Warden. In 1921, the State Park & Forest Commission was established. In 1971, the Dept. of Environmental Protection (DEP) was created to meet growing environmental quality legislation. In 2011, DEP merged with the Dept. of Energy to form the Dept. of Energy & Environmental Protection, or DEEP.

1900s — 2000s



## Today & Tomorrow

DEEP currently oversees 33 State Forests, encompassing 175,000 acres. Acquisition strategies are in place to continue to expand the State Forest system, with a goal of attaining 21% of the State's land base in conservation land.

FUTURE OF FORESTRY

# Why Do We Manage Connecticut State Forests?



## Healthy and Diverse Forests

Connecticut forests are managed to maintain the positive effects of a healthy forest. Forests in good health provide ecosystem services such as clean water, clean air, wildlife habitat, and a sustainable supply of wood products. Forests sequester and store carbon which helps mitigate global warming.

As forests are periodically threatened by external factors (like fire, insects, disease, and climate change,) it is important to continue to monitor and address forest health issues. Healthy, diverse forests have the greatest capacity to adapt to changing conditions, and as long as they remain healthy, they will continue to deliver social and ecological services.



## Water Resource Protection

Forests play a vital role in purifying and maintaining clean water to support diverse aquatic ecosystems and satisfy human demands. Foresters follow Best Management Practices to protect wetlands and watercourses while harvesting forest products.

***Forests in good health provide ecosystem services such as clean water, clean air, wildlife habitat, and a sustainable supply of wood products.***



## Wildlife Habitat

State wildlife biologists monitor wildlife population trends to ensure declining species have access to suitable habitats.

Forest management strategies focus on meeting the requirements of species of greatest conservation need and sustaining imperiled natural communities.



## Research and Education

State Forest land represents a living laboratory of research opportunities for many institutions, agencies, and entities interested in forests. Examples of forest-centered research include: forest changes over time; American chestnut reestablishment; oak resiliency; and Spongy Moth, Emerald Ash Borer, and native wildlife populations.

***Connecticut State Forests provide many benefits such as improved public health, sustainable recreation opportunities, and local economic stability.***



## Sustainable Recreation

Connecticut is among the most densely populated states, resulting in increased pressure on the state's natural resources. The Forestry Division works to provide sustainable recreation opportunities while protecting the ecological resources critical to the health and diversity of Connecticut's State Forests.



## Sawtimber and Cordwood

State Forests provide forest products on a sustainable basis, forever. Wood is a renewable resource and durable wood products can store carbon for generations.

All timber harvesting occurs under the supervision of DEEP foresters with input from wildlife and fisheries biologists. Connecticut's timber can be quite valuable, and much of it is sold to local sawmills to be cut into lumber that supports the local economy. In addition, some wood is exported around the world.

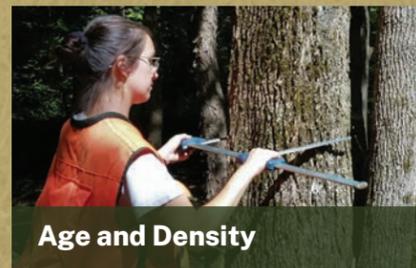
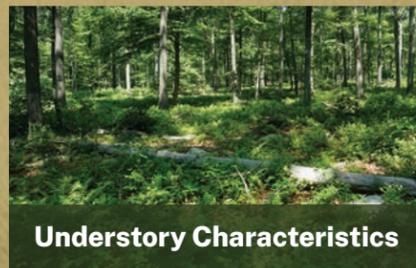
Timber sale revenue is primarily re-invested in the infrastructure and health of the state forests.

# How Do We Manage Forests?

Long-term scientific based management strategies are developed for each state forest and incorporate measures to enhance wildlife habitat, protect water quality, create recreational opportunities, and plan the sustainable harvest of forest products.

## Inventory and Analysis: Resource Assessment

Each forest stand requires a specific management strategy. Successful germination of different species depends on several factors, like sunlight, soils, wildlife, and proximity to other vegetation. These factors influence what is known as forest composition.

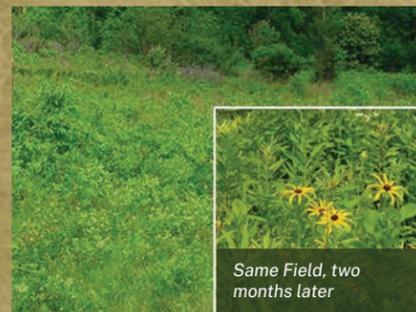


## Harvesting

Harvesting is used during all phases of forest development. Increasing the spacing between trees improves their growth rates and can promote forest regeneration.

## Prescribed Burns

Prescribed burns are another tool used in forest development. The process can alter species composition, prevent wildfires by reducing forest fuel, and maintain habitat for declining species. Scorched earth after a burn recovers quickly, resulting in the vigorous growth of native species.



# Silviculture: The Art and Science of Growing Forests

## Even-aged Systems

Used to develop a forest stand of uniform age. These methods are used to favor trees that need direct sunlight to grow new seedlings, such as oak, tulip poplar and black cherry.



## Thinning

Tree density is reduced to increase the growth rate of individual trees.

## Shelterwood

Forest density is drastically reduced, allowing sunlight to reach the forest floor to encourage the establishment of a new generation of trees. Some trees are left to shelter young trees from damage.

## Final Shelterwood

All the trees are removed from an area at one time. This allows for the maximum amount of sunlight to reach the forest floor, further stimulating the growth of young trees established during previous silvicultural treatments.

## Uneven-aged System

Relies on several scheduled harvests to create or maintain at least three distinct age classes of trees. This method favors shade tolerant trees, such as sugar maple, yellow birch, hemlock and American beech.



## Selection Cutting

Individual trees or groups of trees are harvested to create small openings in the forest canopy, allowing sunlight to stimulate seed germination and increase growth of remaining trees. Over time, surrounding tree and sapling growth closes canopy gaps. At this point, a repeat harvest is conducted to create new openings, continuing the cycle.

# Contemporary Challenges



## Land-use Conversion

Forests face the pressure of development, resulting in fragmentation and parcelization. If converted to alternate land uses, core areas are reduced in size, threatening habitat, increasing demand for a limited resource, and challenging forest industry sustainability.

## Lack of Forest Age Class Diversity

Many of Connecticut's forests are thought to be a century old, creating a deficit of young forest habitat. The lack of forest age-class diversity and composition reduces the forest's ability to withstand major disturbances. Many wildlife species depend heavily on young forests for cover, predator avoidance, nesting, foraging, and more. The Chestnut-sided Warbler (right) is an example of a Species of Greatest Conservation Need (GCN) that requires young forest habitats.



## Increasing Populations of Invasive, Exotic Species

Non-native species degrade forest habitats by displacing native species, preventing the regeneration of trees, and compromising habitat values. Invasive insects such as Emerald Ash Borer and Spongy Moth have contributed to the mortality of many trees. The encroachment of non-native species also creates conditions conducive to the spread of human disease such as tick borne illnesses.

## Lack of Oak Regeneration

For centuries, species of oak have dominated our forests. Oak regeneration is declining due to limiting factors, such as lack of natural fire disturbances, increasing Spongy Moth defoliation, deer browsing, and competition from birch and red maple. On state land, oak management is a priority due to its ecological, cultural, and economic importance to Connecticut.



## Climate Adaptation

As the climate continues to warm, milder winters, hotter summers, and more frequent, intense weather events are becoming more common. These stressors compromise forest health, but can be mitigated by implementing adaptive strategies to encourage species and age-class diversity for forest resilience.

# Public Concerns Q & A



## How Much and How Often?

Only about one percent of areas on an even-aged system are regenerated every year. These are often managed on a 100-year rotation. Actively managed uneven-aged stands are harvested on a 20-year cycle.

## Profit?

DEEP absorbs the cost of cutting hundreds of small trees that have low value to allow sunlight to reach the ground for seed germination or to achieve better distribution of trees. Revenue generated from the sale of forest products is reinvested to promote forest health and maintain the infrastructure of the forest.



## Clean Up?

Wood left on the ground may appear unsightly to some, though it is invaluable for forest regeneration, wildlife habitat, site protection, and nutrient recycling. The highest concentration of minerals and nutrients come from branches and twigs of trees. Harvesting on state lands generally prohibits the removal of woody material smaller than three inches in diameter from leaving the harvest site.



## Replanting

As our forests successfully rebounded after agricultural abandonment, they continued to have an abundance of naturally occurring seed and a great capacity to rapidly regenerate on their own. Foresters on DEEP state forests use natural processes to create conditions for the forest to regenerate naturally from seeds of nearby trees and stump sprouts.



**Connecticut Department of Energy  
and Environmental Protection**  
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