



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

Why We Manage Connecticut State Forests



Message from the State Forester

“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 benefits and ecosystem services from outdoor recreation and home for many different wildlife species to sequestering atmospheric carbon and safe guarding public drinking water supplies. The Division of Forestry’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. DEEP managed forests offer an opportunity for others to see the possibilities their woodlands might offer. Opportunities to study and demonstrate responsible forest management is another benefit and service DEEP State Forests provide. Working across all ownerships can enable a collective leveraged approach, creating wildlife corridor connectivity, limiting emerging damaging agents, and creating a more resilient landscape as our climate changes.”

Christopher R. Martin



DEEP & The Division of Forestry

Provides services to meet the needs of residents and the forest products industry, including: forest fire protection; forest health; public land management; private and municipal forestry; urban forestry; forest practitioner certification; landscape level planning; and enforcement.

D.E.E.P.

Vision Statement

The Connecticut Department of Energy and Environmental Protection (D.E.E.P.) Division of Forestry'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, sustainable resources for local and global utilization, and carbon sequestration.

Preserve

Natural landscapes and resources significant to Connecticut



Photo by Paul J. Fusco

Manage

Forests by utilizing 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



The Shaping of

Post-Glacial Retreat

15,000 years ago



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.

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.



1600's - 1700's

12,000 years ago - 1600's

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



GLADYS AND HAROLD TANTAQUIDGEON

Native Americans

Late 1700's - 1800's



Colonials 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 to move west, seeking employment in cities, that the forest began to reclaim the countryside.

Industry & Development

Connecticut's State Forests

Origins of Forestry in Connecticut

1800's



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.

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 established 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.

1900's - 2000's



Early 1900's

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.



Establishment of State Forests

Future of Forestry



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 open space.

Today & Tomorrow

Why Do We Manage

Healthy & 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 to support the forest-based industry. The trees sequester and lock-up carbon, a vital role in addressing climate change.

As forests are periodically threatened by external factors (like fire, insects, disease, and climate change,) it's important to continue to keep up their management. 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.

Wildlife Habitat



Photo by Paul J. Fusco

State Wildlife Biologists continue to monitor wildlife population trends to ensure declining species have access to suitable habitats.

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

Connecticut State Forests?

State Forests Provide Many Benefits

Research
& 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 gypsy moth, emerald ash borer, and native wildlife populations.

Sustainable Recreation



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

Sawtimber
& Cordwood



State Forests provide forest products on a sustainable basis, forever. Wood is a renewable resource.

All timber harvesting occurs under the supervision of DEEP foresters with input from wildlife and fisheries biologists. Connecticut's timber is 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 Forest.

How Do We Manage Forests?

Contemporary management tactics are based on forestry research, designed to imitate the natural and Native American disturbances that resulted in the diverse forests that greeted the Europeans. Long term 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 extraction of forest products.

Inventory & Analysis: Resource Assessment

Each forest stand (a group of similar trees) requires a specific management strategy. Successful germination of different species depends on several factors, like sunlight, substrate, soil moisture, and proximity to other vegetation. These factors influence what is known as forest composition.



Species
Composition



Understory
Characteristics



Age &
Density

Harvesting

Harvesting is a primary tool utilized during all phases of forest development. Increasing the spacing between trees improves their growth rates, which can promote forest regeneration



Prescribed Burning



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.



Same field, one
year later

Silviculture:

The Art & Science of Growing Forests

The Even-aged Systems

Used to develop a forest stand of uniform age. These methods are used to favor trees that need a lot of 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 cohort 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, stimulating the growth of young trees established during previous silvicultural treatments.



The Uneven-aged System

Relies on multiple scheduled harvests in a forest stand over time to create or maintain at least three distinct age classes of trees. This method favors shade tolerant trees such as sugar maple, yellow birch, 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, thus 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 upon young forests for cover, predator avoidance, nesting, foraging, and more. *The Chestnut Sided Warbler (left) 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 gypsy 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. But due to limiting factors like lack of natural fire disturbances, increasing gypsy moth defoliation, deer browsing, and competition from fast growing birch and red maple, there is a decline in oak regeneration. *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 & How Often?

Only about 1% 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 no value in order 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 are 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 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.

This is an added benefit of state forests, as planting seedlings does not have a high success rate due to deer browsing and competition from naturally occurring seedlings and stump sprouts.

Planting is useful if there is no desirable seed source on site, though it's implemented on a limited basis.





Photos Contributed By:
Paul J. Fusco, CT DEEP Wildlife
Division of Forestry Archives

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