CONNWOOD FORESTERS, INC.

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A FOREST OWNERS' COOPERATIVE ASSOCIATION ENGAGED SINCE 1945 IN THE STEWARDSHIP OF FORESTS FOR WOOD, WATER, WILDLIFE, RECREATION, AND AESTHETICS.

FENTON-RUBY PARK

&

DROBNEY SANCTUARY

2021 – 2031

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General Information

Date Prepared: **May 2021 (Fieldwork)**

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Property Owner: **Town of Willington**

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INTRODUCTION

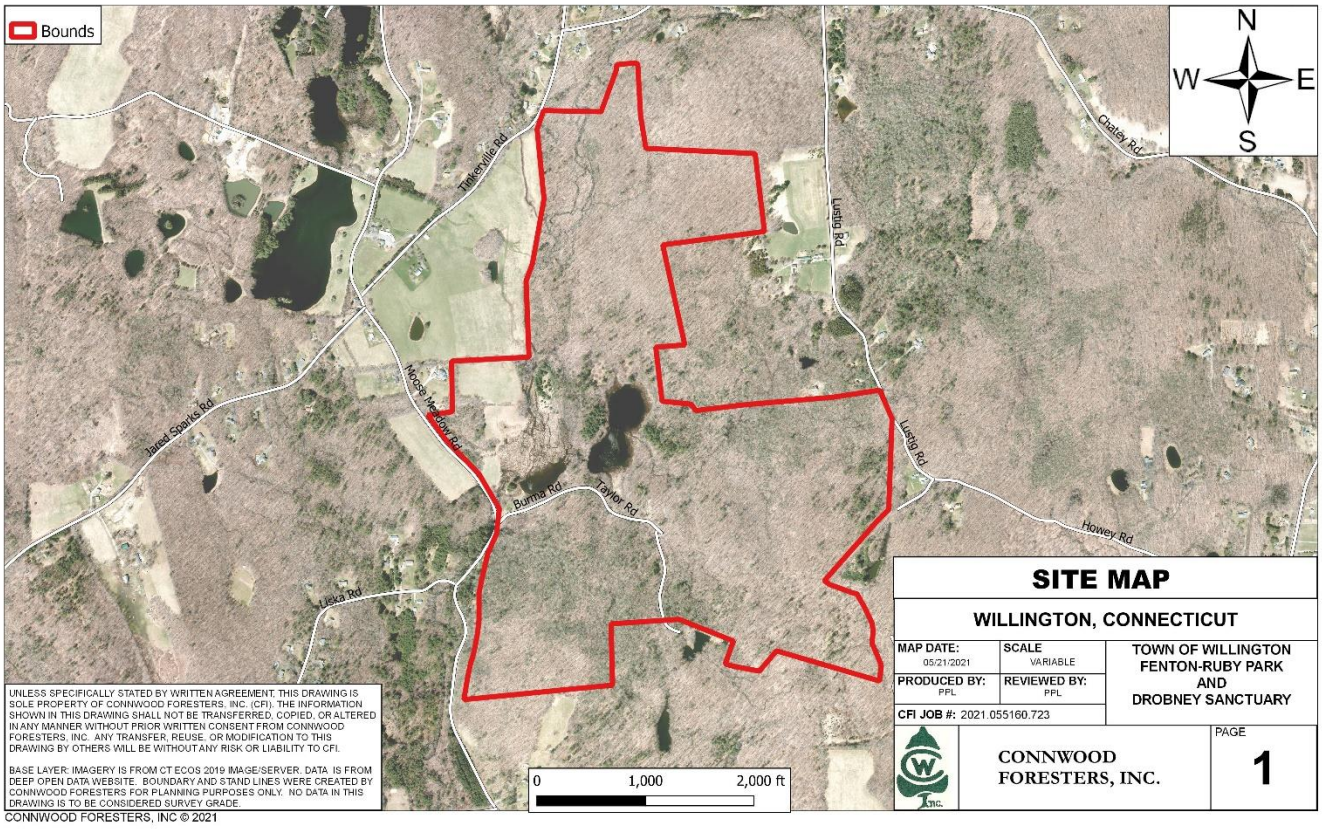
Connwood Foresters, Inc. was retained by the Town of Willington's Conservation Commission to inventory and prepare an updated Forestry and Wildlife Habitat Management Plan for the Fenton-Ruby Park and the Drobney Sanctuary. A plan was written by Jody Rowlands of Connwood Foresters in August of 2001. This document and the earlier one summarizes the results of the examination of the forest resources existing on 225 acres of the Fenton-Ruby Park and 79 acres of the Drobney Sanctuary. The objective of this plan is to assess the area and provide a program of management that could be used as a guide for protection of the park and sanctuary.

The Fenton-Ruby Park and Drobney Sanctuary are managed by the Willington Conservation Commission. They are committed to maintaining the area and enhancing wildlife habitat. The Park and Sanctuary are open to the public to enjoy. It has 4.2 miles of hiking trails that pass through the mostly mixed hardwood forest. Stone walls and 2 old house sites can be observed as one walks the trails. Many varieties of woodland flowers are found blooming, and wildlife is abundant, especially around the ponds and marshlands.

The Fenton River runs through the property and provides important wildlife habitat and outdoor recreational opportunity. The river is a wild trout management area and is stocked by The CT Dept. of Energy and Environmental Protection. Birds are abundant and beavers have built multiple dams. The river is a source of drinking water for the University of Connecticut Storrs campus which draws water to meet its daily water consumption needs from wellfields along the Fenton River. It also contributes to the drinking water supply in the Willimantic Reservoir.

Fenton-Ruby Park was purchased by the Town of Willington in 1994. The site contained 225 acres of forest, grassy fields, streams, marshes, and ponds and was sold with the stipulation that it be maintained as the "Fenton-Ruby Park and Wildlife Preserve". * It was expanded in 2001 with the addition of the Drobney Sanctuary. Access to the park is a small parking area located at the intersection of Moose Meadow and Burma Roads.

*Note: In this document the "Fenton-Ruby Park and Wildlife Preserve" will be referred to as "Fenton-Ruby Park" for brevity.



MANAGEMENT OBJECTIVES

1. To maintain the woodlands in a healthy and aesthetically attractive condition conducive to the spiritual, recreational, and educational needs of the public.

2. To preserve, maintain and enhance major wildlife habitat types, as well as certain micro-habitats, for the direct benefit of individual species and/or guilds of associated or interdependent species.

3. To enhance passive recreational opportunities.

4. To create environmental education and demonstration opportunities for visitors to the park.

5. To preserve the natural and historic integrity of the property in perpetuity.

6. To provide long-term, sustainable management of the forest resource and enhance its resiliency to better deal with climate change and associated stressors.

INVENTORY DATA

The following inventory data was collected in the field:

- ***Identification and delineation of major forest cover types and management units.***
- ***Variable-plot inventory of all trees and timber resources.***
- ***Qualitative inventory of native shrubs, tree saplings and seedlings.***
- ***Determination of forest composition, vigor, and overall condition.***
- ***Notation of observed wildlife species, their sign, or any outstanding habitat features.***
- ***Documentation of insect or disease infestation or evidence of tree species in decline.***
- ***Quantitative and qualitative evaluation of all tree growth for silvicultural applications.***
- ***Identification and impact assessment of established invasive plants.***

The following resource concerns were observed in the field while collecting inventory data:

- ***Crown senescence and little regeneration***
- ***Invasive plants.***
- ***Ash mortality due to emerald ash borer.***

WHY FOREST MANAGEMENT

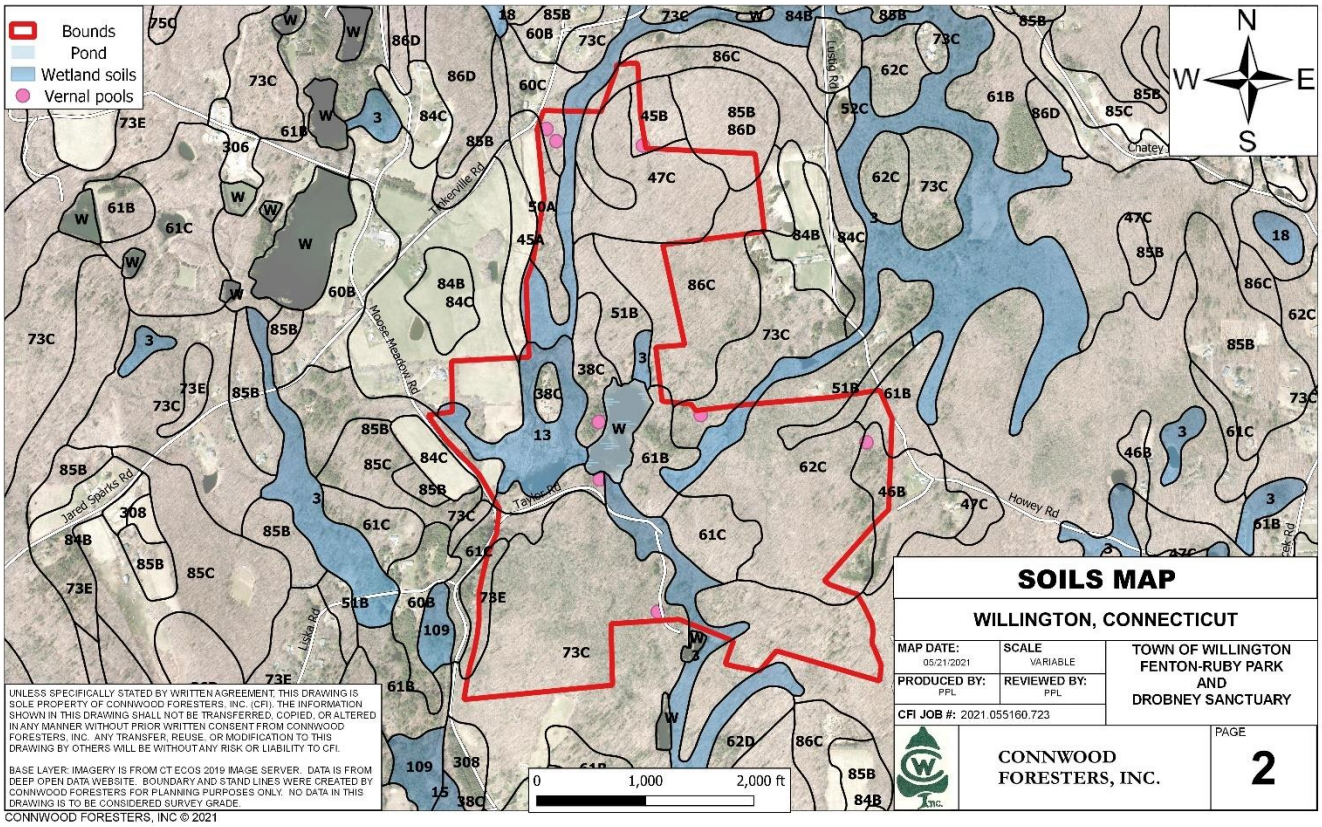
It is important to maintain a healthy, resilient, and disease-resistant forest. A method to ensure a healthy forest is through maintaining diversity of tree species, ages, and sizes/structures through forest management. Species diversity within each eco-type creates a resilient structure which limits impact of pests like the emerald ash borer. Across the landscape, having different forest ages, sizes, and structure can lessen the impact of a storm event. The "mosaic of patches" application in forest management protects against forest-wide loss of tree cover. Uncontrolled disturbance of the canopy, especially in locations where non-native invasive species grow unmanaged, can promote loss of forest. Forest management uses natural disturbance regimes to increase water and light resources to establish a new "cohort" or area of new trees. As these new trees establish then persist in the understory, they can replace trees lost during uncontrolled disturbances. Other considerations during forest management include forest vegetation structure, leaf litter, and varied microtopography. These factors increase nutrient and soil stabilization, increase interception, storage, and filtration capacity of urban runoff and rainwater, and impact wildlife and bird habitat viability. Creating healthy forest systems by mimicking natural disturbances may involve timber harvesting. In Connecticut, it is estimated that the wood products industry output is approximately $3.96 billion. Wood products as a sustainable resource make a net positive impact in ecosystem services, the value of conservation, and combating a "throw-away" culture. On a final note, not doing any management is also a management option. Connecticut has been trending towards fragmented forest parcels of under 50 acres per owner; moreover, suburban sprawl and fragmentation decreases the likelihood of forest management, specifically landscape scale management focusing on "mosaic of patches." Data regarding number of actively managed acreage to unmanaged acreage does not exist, but it is generally accepted through the industry

that with smaller lot sizes, a landowner experiences a decrease in economic viability making it easier for an individual landowner to choose a "no-management" option.

SOILS

The soils are mainly sandy glacial till derived from bedrock composed of granite and/or gneiss and/or schist. These soils originate from the glaciers that ground the bedrock into soil particles 10,000 years ago. These soils are therefore called glacial till: a blend of many mineral particle sizes (clay, silt, sand, and stones) that the glacier mixed up and deposited.

Soils provide nutrients, moisture, and support for trees and other plant life in forest ecosystems. Soils help determine the types of trees and how well they grow on any given site. Soil quality varies greatly with topographic position. Upper slopes are dry and have thin, coarse soils whose nutrients have been leached to lower slopes. As a result, upper slopes typically have trees of shorter stature that grow slower. Mid-slopes are moderately moist and have moderate soil nutrition and support the most vigorous tree growth. The bases of slopes hold moisture and even though they are nutrient rich, they often support poor tree growth due to the abundance of water and lack of oxygen in their soils. Species composition and growth reflect this topographic soil pattern.



SOIL TYPES

Map Unit Legend	Map Unit Name	Acres	Percent	Wetland Soil
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	25.3	8.3%	Yes
13	Walpole sandy loam, 0 to 3 percent slopes	18.2	6.0%	Yes
38C	Hinckley loamy sand, 3 to 15 percent slopes	10.2	3.3%	No
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	0.0	0.0%	No
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	1.6	0.5%	No
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	5.0	1.6%	No
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	24.9	8.2%	No
50A	Sutton fine sandy loam, 0 to 3 percent slopes	6.5	2.1%	No
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	12.8	4.2%	No
60B	Canton and Charlton fine sandy learns, 3 to 8 percent slopes	4.5	1.5%	No
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	2.3	0.8%	No
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	11.4	3.7%	No

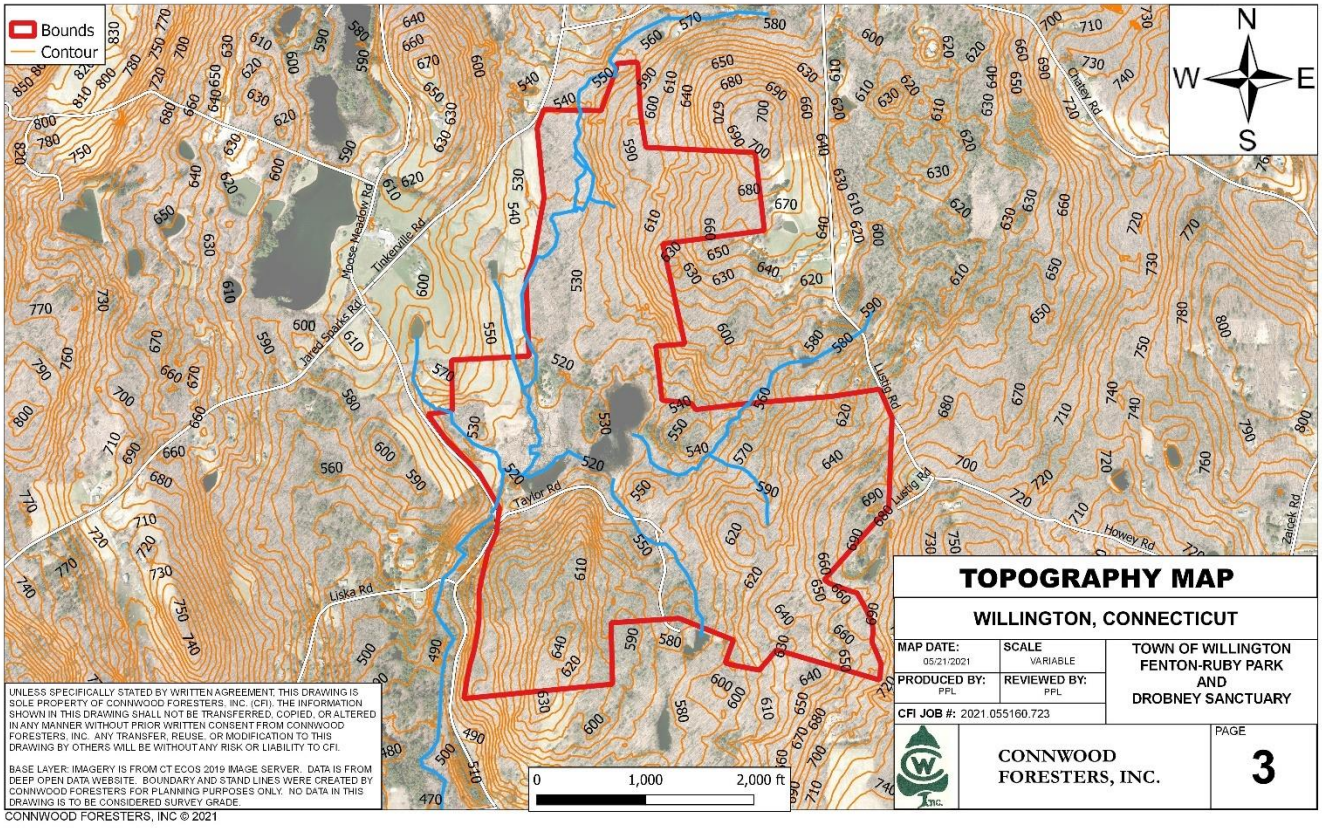
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	13.7	4.5%	No
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	43.8	14.4%	No
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	78.5	25.8%	No
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	3.0	1.0	No
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	9.5	3.1%	No
85B	Paxton and Montauk fine sandy learns, 3 to 8 percent slopes, very stony	5.4	1.8%	No
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	14.4	4.7	No
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	5.8	1.9%	No
W	Water	7.4	2.4%	N/A

SITE

The property is in eastern Willington in Tolland County. The site includes approximately 280 acres of forestland. The remaining area is open fields, marsh, ponds, streams, and rivers. The properties surrounding the park are mainly farmland or forest with only a few single-family homes. To the east is the 72-acre Langhammer Town Forest that is owned by the Town of Ashford. A spur trail connects the 4.2 miles of hiking trail in the Fenton-Ruby Park and Drobney Sanctuary with the trails of the Langhammer Forest. Various viewing sites with benches or chairs have been constructed along the trails around Taylor Pond.

The property has an elevation change of 180 feet from a low of 520 feet near the entrance to the park to a high of 700 feet on the south-east corner of the property. The area drains to the west and the streams empty into the Fenton River. The Fenton River flows south and eventually into Mansfield Hollow Lake, an Army Corps of Engineers flood-control project.

Viewing area (PM 32)



WATER QUALITY AND SOIL PROTECTION

Protecting water quality requires preventing erosion in order to keep the soil and its nutrients in the forest and out of the wetlands and watercourses. This means using erosion control methods on trails and roads, and as part of any forest activities to control the volume and velocity of water on unprotected soil. Such methods include installing water bars, spreading mulch, and spreading grass seed as needed. It means hardening trails with rocks and logs at wet or erosive areas to prevent soil disturbance.

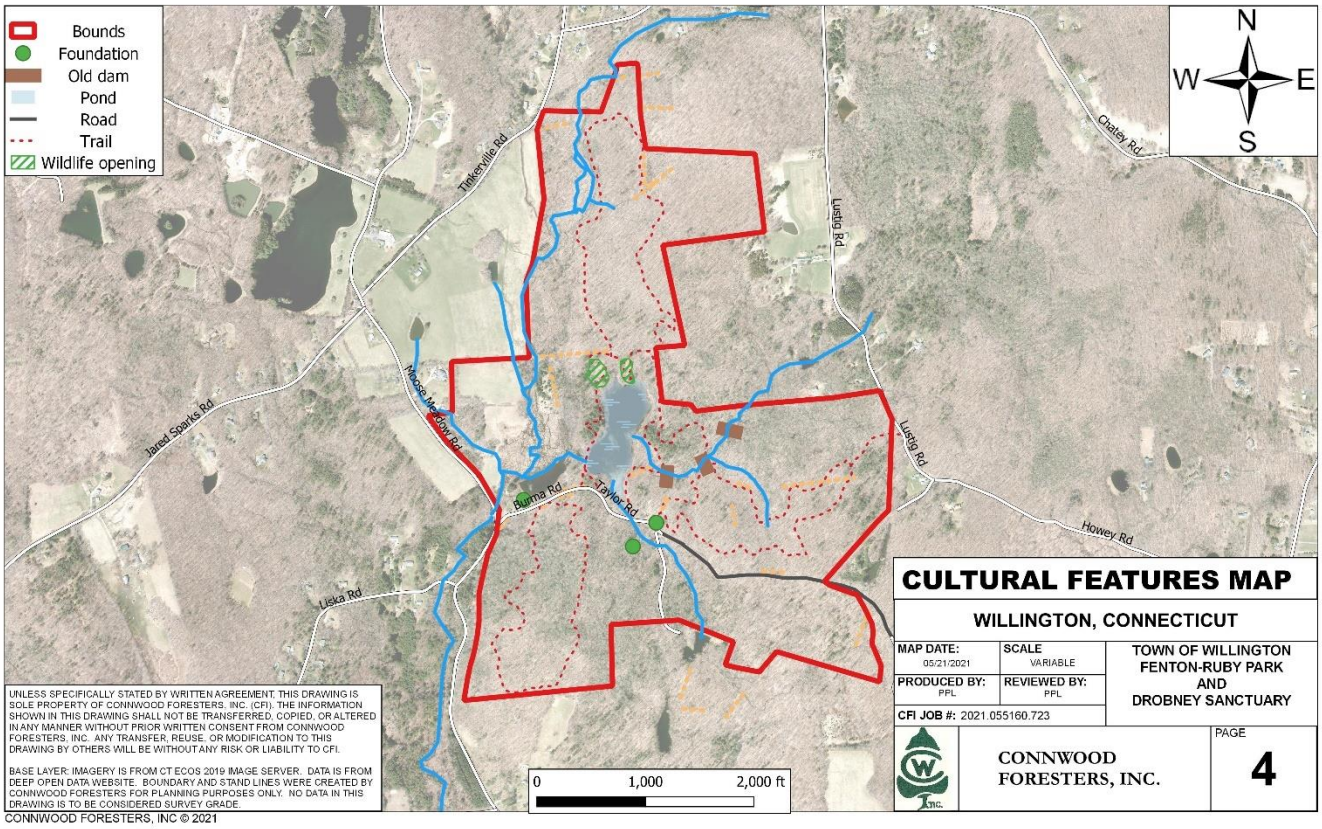
Three vernal pools were observed while walking the property. Vernal pools are seasonal wetlands or spring pools that are covered by shallow water for variable periods from winter to spring. They may be completely dry during most of the summer and fall. These pools serve as breeding habitat for amphibians such as salamanders and frogs. The Commission has mapped at least 3 others.

A no-cut buffer strip of at least 50 feet should be maintained along all major brooks and edges of vernal pools. Intermittent streams should have selective cutting of trees where at least 50% of the tree canopy cover is retained within 100 feet of wetlands and watercourses. Such measures provide a protective buffer that can filter out damaging pollutants, nutrients, and sediments before reaching water resources. Buffers maintain shade to keep the water cool and when cooler, water holds more oxygen and is inherently healthier for most aquatic life. Finally, these buffers provide a natural source of forest debris (logs, branches, leaves, etc.) that is an integral part of maintaining the biological/ecological health of wetlands and watercourses.

When equipment is being used on the property, it should not be allowed to be parked overnight within 100 feet of a stream or the brook. A spill kit should be on site during any activity, and should a spill occur, appropriate actions should be taken, and the proper authorities notified immediately.

CULTURAL FEATURES

There are two sites where houses once stood. One is near the entrance to the park, the other is just off the Ruby hiking trail from Burma Road. A third foundation is found south of Burma Road in the forest. The function of this structure is unknown. Three breached dams are found on the streams running into Taylor Pond. Their function is unknown. Stone walls are found throughout as are barbed wire fencing, indicating that farming once occurred on the property. The cultural features should be protected for the future. Activities that damage the structures should be prohibited.



Old Foundation (PM 10)

Foundation at entrance (PM 1)

Remains of old dam (PM 13)

Stone walls (PM 23)

FOREST RESILIENCY AND CARBON SEQUESTRATION

Carbon sequestration is the process in which atmospheric carbon dioxide is captured from the atmosphere and stored long-term into biomass (organic material that comes from plants and animals). The sink of carbon sequestration in forests and wood products helps to offset sources of carbon dioxide to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions. Carbon sequestration involves storage of carbon dioxide or other forms of carbon to mitigate or defer global warming. It is believed that this is a way to slow the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels. Trees use photosynthesis to convert carbon dioxide into sugar, cellulose, and other carbon-containing carbohydrates that they use for food and growth. Trees lock up large amounts of carbon in their wood and continue to add carbon as they grow. Healthy forests typically store carbon at a greater rate than they release carbon. The carbon is stored and is returned to the atmosphere by burning or the rotting of the trees when they die.

Sustainable forestry practices can increase the ability of forests to sequester larger amounts of atmospheric carbon while enhancing other ecosystem services, such as improved soil and water quality. Healthy fast growing trees will capture more of the carbon dioxide from the atmosphere than a stunted poor-quality tree. Planting new trees and improving forest health through thinning are ways to increase forest carbon sequestration in the long run. Harvesting and regenerating forests can also result in net carbon sequestration in the production of wood products and new forest growth. Other ways are forest preservation by protecting the lands from deforestation and by not clearing the land for developments.

We are now facing an uncertain future, in which our forests will encounter many challenges, including land conversion; invasive plants, insects, diseases; heavy deer browse, and climate change. Though our forests are resilient, they also have characteristics that make them vulnerable to these stressors to varying degrees. While there is uncertainty as to how our forests will react to these stressors, we can be confident that our forests will change. Understanding the stressors that our forests face will help to address them and the actions to take.

Forest Conversion:

Conversion of forests to other land uses eliminates all the benefits that the forests provide. Conversion isolates forests from one another. Subdivisions and single-unit housing make any adjacent forest further away. This means that now the smaller forested areas are more vulnerable to stressors because it is a smaller area with less trees. The likelihood of emerald ash borer killing all the ash trees is increased because now the area is a small, isolated environment and not a large, forested expanse.

Developed areas can be a source of invasive plants and insects and impervious surfaces causing increased runoff and erosion. This also means smaller areas with fewer trees producing mast and fruit for the animals, less predators, and over population of deer which can lead to overgrazing. Overgrazing leads to reduction of native tree species regeneration and an increase in invasive plants that native animals do not prefer to eat. At times, the understory can be converted to a monoculture of invasives such as barberry or euonymus.

Climate Change:

Over the past few decades, we have seen changes in the climate. We now have warmer days, shorter winters, and more intense rain and storm events. The growing season has increased by more than one week in some parts of New England. Longer growing seasons help increase forest productivity but may make trees more susceptible to late spring frosts. There are increased amounts of carbon dioxide in the atmosphere. Increasing temperatures may lead to drier conditions and longer periods between rain events, resulting in drought-like conditions. Experts predict a shift of habitat conditions for many plant species moving further north and to higher elevations. These conditions may favor species that presently grow further south and will likely mean more of an oak-hickory mix. Species such as white pine, hemlock, and spruce may not be able to compete.

Warmer temperatures may lead to an increase in invasive species of plants as well as an increase in some native and non-native insects. We are now seeing certain species of ticks that have long been kept in check by the cold now moving further north each year. The drought like conditions during the past 3 years stressed trees and allowed the gypsy moth to defoliate and kill large areas of oak forests. Normally, wet conditions would allow a fungus to infect the larval stage of the moth and kill it before it totally defoliates an area.

Goals to improving forest resiliency:

1. Maintain a diverse forest with a range of ages, sizes, and cover on a range of sites.
2. Reduce and limit stressors on the forest where possible and maintain forest health and vigor.
3. Maintain a complex forest structure and reduce forest disturbances.
4. Maintain a healthy level of plant and animal diversity within the forest.
5. Maintain a low level of deer population to reduce over browsing.
6. Limit invasives, insect, and disease pressure.

More information can be found in the attached position paper of the Yankee Division of the Society of American Foresters.

DIVERSITY

A forest made up of different tree and plant species influence its ability to handle stress and change. Generally, a forest with higher levels of tree and plant diversity has a higher resiliency. Some tree species likely will face more challenges in the future as a result of pests and diseases as well as warmer climate conditions. Forests made up of these species may be at greater risk. Forests with many species tend to be more resilient to many types of stressors simply because not all species are susceptible to the same challenges.

In addition to the diversity in tree species it is important to maintain a range of ages and size classes within the forest. Large trees are subject to wind damage more readily than a small sapling or pole. Certain sized trees are more susceptible to insect attack such as white pine weevil preferring the leader of saplings and poles. It is important to consider promoting a mixture of species and age classes that are well adapted for the future.

The property has many tree species. Below is the break-down of the diversity of the number of trees (those measured in sampling 6" DBH and larger). Other species that were not measured in the sample plots included black cherry, sassafras, white birch, hawthorn, gray birch, cedar, hemlock, and elm.

White Oak	Red Maple	Red Oak	Hickory	Pine
14.8%	23.0%	5.8%	10.9%	18.8%
Aspen	Beech	Birch	Ash	Scarlet Oak
.2%	.4%	2.9%	.3%	3.3%
Sugar Maple	Black Oak			
13.8%	5.8%			

PERCENT BY SIZE CLASSES

Pole (6-12"DBH)	49%
Small Sawtimber(12-16"DBH)	31%
Medium Sawtimber (16-18"DBH)	14%
Large Sawtimber (20+"DBH)	6%

FOREST HEALTH

While evaluating the forest, it was noted that emerald ash borers have killed most of the ash trees. These are an introduced insect that causes almost 100% mortality of any ash tree it attacks. Once dead the tree becomes brittle and is of little value for firewood or lumber.

Beech bark disease has infected some of the beech trees. Beech bark disease causes mortality and defects in beech trees and occurs after extensive bark invasion by the beech scale insect, *Cryptococcus fagisuga*. Feeding by this insect causes two different fungi *Neonectria faginata* and *Neonectria ditissima* to produce cankers on the bark of the tree. The continuous formation of lesions around the tree eventually girdles it, resulting in death. Harvesting the infected trees is a control method.

Emerald ash borer exits holes (PM 9)

Beech bark disease (stock photo)

Some of the birches have nectria cankers, a common affliction among all species of birch. It can kill a tree but usually only causes stem deformities and loss of quality. The birch canker is a native affliction with the primary treatment being removal of infected trees.

Only a small number of hemlocks showed signs of hemlock woolly adelgid. Native to Asia, the hemlock woolly adelgid, is an invasive, aphid-like insect that attacks hemlocks. The insects are small (1.5 mm) and often hard to see, but they can be easily identified by the white woolly masses they form on the underside of branches at the base of the needles. Their feeding severely damages the host tree by disrupting the flow of nutrients causing the decline of the health of the tree.

Nectria canker (stock photo)

Hemlock woolly adelgid (stock photo)

Areas of the property received minor damage from past storms. Some tops were broken, and trees uprooted. No major areas of mortality were noted, and most of the trees recovered even though their growth rate may have been reduced.

NON-NATIVE INVASIVE PLANTS (NNIP)

There are areas of invasive or non-native species found on the property. Along the roads, open areas, near the old house sites, and along the streams are pockets of Japanese barberry, euonymus, autumn olive, multiflora rose bushes, and Oriental bittersweet vines.

Early detection and control of invasives will significantly reduce costs of control later. Invasive species are typically from another part of the world and likely have no native enemies to hold their population in check. They tend to be hyper-competitive by leafing out in the spring earlier than native plants and be prolific producers of seed and vegetative reproduction. When left uncontrolled, they spread into natural landscapes and replace the native understory vegetation. For instance, in wetlands phragmites may take the place of native cattails.

Controls include mechanical and chemical methods. Although difficult and labor intensive, in areas of low density pulling invasives out by the roots can be highly effective. Yearly cutting of the above ground stems will keep the invasives under control, and perhaps kill them after a few years. The most effective method is an herbicide treatment during the growing season.

Japanese barberry bushes (PM 28)

FOREST DEVELOPMENT

As a forest ages, the trees grow to large sizes and in that process become fewer in number. A young forest of newly established seedlings may have more than 5,000 trees per acre. Twenty years later there are 500 trees per acre. After 50 years there are 200-300 six-inch diameter trees per acre, and in another fifty years there are 50 sawtimber trees per acre. After 100 years, approximately 97% of the original 5000 seedlings per acre have died leaving the remaining 3% of the trees to mature into the trees you see today.

The process of forest maturation is that 4,950 trees died and rotted away because they lost the competition for limited growing space. This process continues until the mature trees die from old age, disease, wind damage, forest fire, or are cut. This process has occurred on this property over the past 100+ years.

Each time a tree dies, the surrounding tree crowns expand to fill in the canopy opening. When a large tree dies, or a group of trees die, the opening is too large for the surrounding trees to fill. When this happens, the understory trees will fill the gap. Eventually all the trees we see today will die and be replaced by their progeny in the understory.

You can accelerate and improve forest development by selecting the trees that will dominate the stand. You may favor the healthiest and most vigorous trees or favor a tree for its value to wildlife, like red cedar. You may favor a tree for its products, like sugar maple for syrup or for its longevity, like white oak. You can take much of the chance out of the development process by guiding how the forest develops, based on the management objectives.

You can favor a tree's survival and vigor by opening growing space around its crown. This allows the tree to expand its crown and receive more sunlight. In turn, this increases the tree's photosynthetic capability and makes it grow faster and more resistant to insect and disease problems.

Stand 8 was harvested in 2016. There are few seedlings found throughout the stand. At each sample there were 3-5 present in a 1/100-acre size plot. This may be attributed to a high population of white-tailed deer which generally prefer and feed on native vegetation. Often areas with the most regeneration are those that had suffered storm damage and now have openings in the canopy or in areas where the overstory has been reduced. Along the brook in Stand 6 several trees had blown over and black birch regeneration had filled the opening. The same can be accomplished by creating a series of small opening of ¼ acre in areas of a stand with good seed trees.

Even though there are limited number of seedlings, overall the project has over 49% pole size trees. These trees will eventually grow into the next generation of forest.

WILDFIRE RISK

The wildfire risk on the property is moderate. Abutting the area are single family homes and fields. Old used fire pits were noted while walking through the property. The possibility of a fire starting from an illegal camper, an outdoor grill, cigarette, or child playing with matches is not something to be overlooked. The streams, wetlands, trails, and roads do provide natural fire barriers and will help to slow the spread of a fire. The roads and trails within the park provide access for fire equipment.

The property does not have a buildup of large woody debris, so the possibility of a large fire is limited. The homes surrounding the property will make sighting of smoke from a fire likely to be reported quickly. During drought conditions, limiting access, equipment use, and fires may be recommended practices.

WILDLIFE HABITAT

Varied wildlife habitat is important and provides the necessary food, cover, and water for many types of animals found in this region. Habitat variation may include deciduous trees, cedar and other scattered coniferous trees, forested wetlands, stream banks, brush, saplings, older trees, a pond, and wildlife openings.

A diversity of tree species ensures a greater variety of foods and therefore a diversity of animals. The diversity of tree sizes affords many different roosting, nesting, and feeding opportunities for birds. The wood thrush, for example, sings from the upper canopy, nests in the mid-story, and feeds on the ground.

As is common on most properties in southern New England, transient deer populations are evident by herd paths, droppings, scrapes and rub lines. The population, for most of the area, is high and is a burden to the forest because of over-browsing of native plants. A high deer population can significantly impact regeneration of native plant life, especially oak trees.

Cover: Cover may be a hemlock tree for a screech owl (sleeping cover), a stone wall for a chipmunk (escape cover), or a dense patch of brush for a deer (resting cover). An animal's cover requirements are variable. Deer and grouse generally feed in relatively open areas of forests, but during a winter snowstorm they seek refuge in a dense stand of conifers.

Dead Wood/ Snags: A critical part of the forest habitat is dead wood. Standing dead trees (snags) and dead wood on the ground serve important habitat benefits. Over one-quarter of the wildlife species that potentially inhabit this property require dead wood, hollow trees, or rotten wood for some part of their life cycle. Dead wood provides cover, moisture, nest sites, and den sites.

Snags are standing dead trees that provide food and cover for over 85 wildlife species. Snags are important foraging sites for many species of birds and often serve as cavity trees when primary excavators, such as woodpeckers, initiate cavity development. Snags, especially those with good vantage points in clearings or along edges, are also used as perching sites for raptors, phoebes, and other birds. A greater number of wildlife species will benefit from large snags (greater than 18 inches diameter) as opposed to numerous small ones. Large snags generally last longer and can be used by both large and small birds and mammals.

SNAGS 16+" DBH PER ACRE

Stand 1	Stand 3	Stand 4	Stand 5	Stand 6
1.9	0	0	0	2.54

Stand 7	Stand 8	Stand 9	Stand 10	Stand 11
2.58	1.22	2.28	4.65	1.2

Presently there are a limited number of snags for the wildlife. NRCS recommends that there be 2 or more snags per acre. Only Stand 6, 7, 9, and 10 have this number. Any future management should include creating more snags by girdling trees that are 16"DBH and larger and also retaining any standing dead trees.

Cavity or Den Trees: Den trees are trees having the trunk or large limbs hollowed out by rot, with an opening to the outside. Cavities in trees of all sizes are essential to many species of birds and mammals. Black-capped chickadees and eastern bluebirds use cavities in stems less than 6 inches in diameter. Gray squirrels, screech owls, and various woodpeckers such as northern flickers use cavities in stems between 12 and 18 inches in diameter. Larger birds and mammals such as pileated woodpeckers, fishers, and raccoons require larger cavities in stems greater than 18 inches in diameter. Few large cavity or den trees were noted while walking the property.

Dead Snag/Cavity Tree (PM 16)

Brush Piles: A small portion of brush should be piled wherever possible and practical to provide additional wildlife cover. This can be combined with efforts to move woody debris away from walking trails and wildlife openings. Small mammals and some birds (wrens) use such piles for cover and bears use them to den. Such piles are particularly desirable if located near water or the edge of forest openings. Large wood and rocks form the base, which are covered by progressively smaller branches to form a mound that is about 6 feet high and 15 feet across.

Conifers: Some conifers (pine, hemlock, spruce, or cedar) should be retained to provide mammals and birds protection from harsh winter weather. They provide food and cover for resting, roosting, and nesting. They help to moderate the effects of inclement weather. Forests that contain both conifer and deciduous trees generally contain more wildlife species than either kind exclusively. Ruffed grouse, white-tailed deer, red and northern flying squirrels, red-breasted nuthatches, golden and ruby-

crowned kinglets, solitary vireos, and bay-breasted warblers are examples of Connecticut wildlife species attracted to conifers. Cedars are particularly beneficial because the provide excellent winter cover and food (blue cones) for birds and mammals.

Perches: Perching sites are most often found in old fields, pastures, roadsides, riparian corridors, and in stands with an overstory tree that clearly towers above all other forest vegetation. Supra-canopy white pines, hemlocks, yellow poplars, and large roadside sugar maples are examples of high exposed perching sites. The exposed nature of these high perches provides excellent hunting and nesting sites for various raptors such as osprey, red-tailed hawks and kestrels that forage in non-forest cover types and open forests. Fences, utility lines, isolated deciduous shrubs, and woody sprout clumps less than 10 feet high can serve as low perches.

Travel Lanes: Fence rows, stonewalls, drainage ways surrounded by tall herbaceous vegetation and low woody growth make excellent travel lanes. Stonewalls provide structure to wildlife habitats and are especially valuable as travel lanes. For small mammals, such as chipmunks, stone walls serve as an important cover for nearly all daily functions. For larger species, stone walls provide protective cover along which to travel. Where stone walls border fields or woodland roads lush herbaceous edges may be present.

Food: Food, a source of energy for growth, maintenance of good health, and reproduction is essential to all wildlife species. All animals must have an adequate seasonal supply of nutritious foods provided by a variety of habitat types. The seasons and weather can be important factors in determining food availability. Insects, grasses, forbs, mast (nuts), and fruits as well as other animals are important food sources for wildlife in Connecticut.

Hard Mast**:** Hard mast is hard-shelled seeds (nuts and acorns) that provide a high caloric source of digestible lipids and carbohydrates needed by most resident and migratory wildlife species. Native hard mast producing trees include the oaks, hickories, and beeches. A variety of these tree species will ensure food all year and will provide insurance against seed failure of any one species. White oak acorns are particularly valuable because of their high protein content.

Fruit: Fleshy (soft) fruits produced from a variety of native shrubs are an important food source for wildlife. Some common shrubs of high value are blueberry, huckleberry, common juniper, serviceberry, spicebush, winterberry, dogwoods, sumacs, and viburnum.

Current Habitat Conditions:

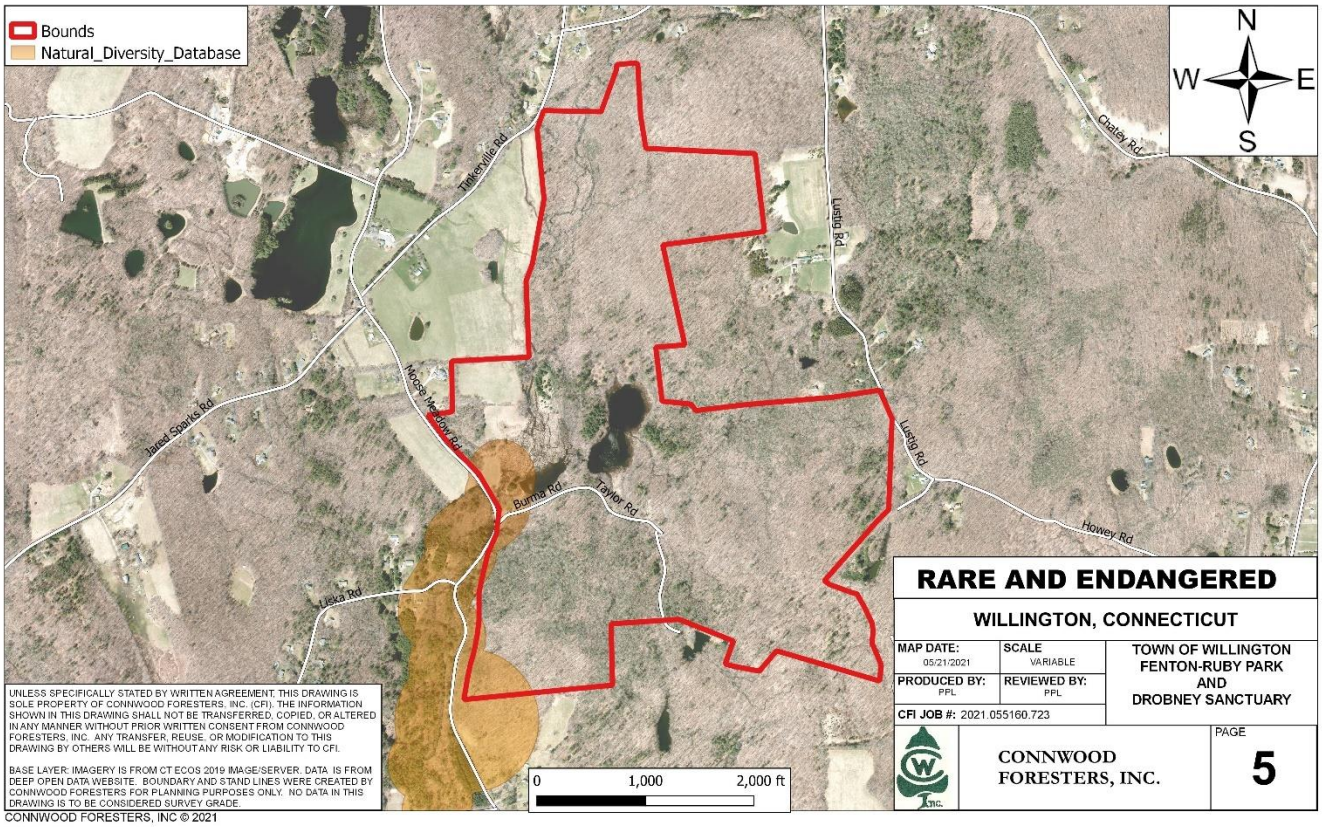
The habitat on the property is varied. There is dense cover and water available throughout. There are fields, streams, vernal pools, drainages, wetlands, and marsh. Oaks and hickories produce nuts, and cedars and shrubs such serviceberry and huckleberry produce berries. The pines provide winter cover. There is an apple tree and elderberry bush near the information board and two wildlife clearings near Taylor Pond.

While walking the property I observed deer trails, droppings, and their bedding areas. I also observed three types of woodpeckers, an oriole, Black and White Warblers, Common Yellowthroat, cardinals, hummingbird, nuthatches, swallows using the nesting boxes in the field, various other songbirds, turkeys, and squirrels. I noticed hawks flying, and ducks and a heron in Taylor Pond.

Wildlife habitats can be improved by providing several different forest layers. Early successional habitat is one of the priority habitats in Connecticut. They provide habitat for approximately 80 bird species as well as several mammals, reptiles, and amphibians. The Wood Thrush and Scarlet Tanager prefer a mixed deciduous forest interspersed with hemlocks and pines including a mix of large and small trees. They usually nest in understory shrubs and forage in loose leaf litter. Mature oaks and hickories provide mast (nuts) for turkeys and deer.

Future management may include mowing the two small openings in the forest and building brush piles to provide cover for small mammals and birds. Snags can be created by girdling trees where needed. Wetlands and vernal pools need to be protected by keeping a buffer strip of at least 50 feet around them. These pools are habitat for breeding amphibians and provide water for the other animals of the forest. When conducting any activity near these areas the brush and other debris should be limited as they may hinder the migrations of the various amphibians. The Fenton River should have a buffer strip retained along either side of the brook to help moderate water temperatures, maintaining a suitable environment for trout.

RARE, THREATENED, AND ENDANGERED SPECIES



There are listed species shown to possibly exist on the property. DEEP reviewed the Natural Diversity Data Base (NDDB) maps and files regarding the project. According to their records, there is a State-listed species (RCSA Sec. 26-306) documented within or nearby the proposed area: Wood turtle (Glyptemys insculpta) – State special concern. Individuals of this species are riverine and riparian obligates, overwintering and mating in clear, cold, primarily sand-gravel and rock bottomed streams and foraging in riparian zones, fields and upland forests during the late spring and summer. They hibernate in the banks of the river in submerged tree roots between November 1 and March 31. Their summer habitat focuses within 90m (300ft of rivers) and they regularly travel 300m (0.2 mile) from rivers during this time. During summer they seek out early successional habitat: pastures, old fields, woodlands, powerline cuts and railroad beds bordering or adjacent to streams and rivers. Their habitat in Connecticut is already severely threatened by fragmentation of riverine, instream, riparian, and upland habitats, but is exacerbated by heavy adult mortality from machinery, cars, and collection. This is compounded by the species late maturity, low reproductive potential, and high nest and hatchling depredation rates.

More information is available on the attached information sheet in the Appendices (**NDDB DETERMINATION NUMBER: 202107992)**.

The northern long-eared bat is a species of concern and may be present. It is federally listed as a threatened species under the Endangered Species Act. This bat is likely to become endangered in the future. Their population had declined dramatically due to the white-nose syndrome that is a fungus. Their habitat is a mine or a cave in the winter and various forest habitats in the summer. Any activity on the property should consider mitigation to limit the potential impact to the bat.

If future forestry practices are conducted, it should be planned to minimize negative effects on recreation, wildlife, soils, and residual forest resources while simultaneously maximizing benefits to wildlife habitat and forest health. The implementation of forestry practices should not be driven by market conditions.

Forestry operations, particularly those using heavy forestry equipment should occur during dry or frozen ground conditions to minimize soil rutting and compaction. The vast majority of migratory wildlife will have left Connecticut and the young-of-year of resident wildlife are more mobile by the time the dormant season arrives. The preferred operational timeframe for the implementation of forestry practices is November 1 to April 1. Forest operations outside of the preferred timeframe require compliance with the Migratory Bird Treaty Act, and Compliance with the 4d Rule for Northern Long Eared Bat (NLEB) at a minimum. Additional actions may be necessary as specified by CT DEEP NDDB technical staff to minimize the negative impacts to wildlife or other forest resources.

Compliance with the Migratory Bird Treaty Act:

- No tree cutting between April 15 and August 15.
- If tree cutting operations need to occur within this window for other wildlife species or other forest resources, then a nest survey of the harvest area must be conducted before any tree cutting occurs.
- Select trees may need to be retained or avoided depending on the nest survey.

Compliance with the 4(d) Rule for Northern Long Eared Bat:

- The entirety of CT is within the white-nose syndrome (WNS) zone.
- No tree cutting within a 0.25-mile radius of known NLEB hibernacula.
- No tree cutting between June 1 and July 31 (pup season).
- Tree cutting between April 1 and June 1 or August 1 and November 1 requires consultation with USFWS. Consultation takes 30 days, after submittal to USFWS.

POLLINATORS

Pollinators are birds, bats, butterflies, moths, flies, beetles, wasps, small mammals, and bees. They visit flowers to drink nectar or feed off pollen and transport pollen grains as they move from spot to spot.

Below is a list of native trees, shrubs, and wildflowers used by pollinators. Plantings of any of these or wildflower mixes around the fields or wildlife openings will provide areas for pollinators to gather nectar or pollen. The USDA recommends that acres selected for pollinator habitat should be at least 0.5 acres. Planting in blocks is preferred over strip plantings, but if planted in strips, each strip must be a minimum of 20 feet wide. Grasses seeded in this practice should be native. Although native species are encouraged, beneficial introduced flowering plants (e.g., alfalfa and clover) may be part of the seeding mix. Seeding mixes generally require a minimum of nine species of pollinator-friendly wildflowers, legumes, and/or shrubs.

Trees and Shrubs

Maple	Sumac	Bearberry
Willow	American beautyberry	Black cherry
Tulip tree	Arrowwood	Hackberry
Black locust	Rhododendron	Lowbush blueberry
Basswood	Azalea	New Jersey tea
Red chokeberry	Red osier dogwood	Smooth serviceberry
Spicebush	Sweetfern	

Flowers

Golden Alexanders	Ohio Spiderwort	White Beardtongue
Milkweed	Anise Hyssop	Wild Bergamot
Mountain mint	Blazing Star	Blazing Star
Boneset	Joe Pye Weed	Fall Sneezeweed
New York Ironweed	Goldenrod	New England Aster

AESTHETICS

There are many opportunities to improve the beauty or aesthetics that fall outside of traditional landscaping. Two activities have already been mentioned and have benefits beyond aesthetics: vine and invasive species control. Most would agree that hanging vines and thorny invasive species have little beauty. Controlling vines and invasives creates a more park-like forest that appeals to most people because it is much easier to see through and walk through.

With the same methods discussed for vine and invasive species control, you can eliminate portions of the understory of a forest to create a truly park-like setting. The improved visibility and lack of understory clutter is very attractive and enjoyable. Such clearing could be used along the trails but should not be large scale. The wholesale destruction of understory vegetation is detrimental to bird, mammal, and amphibian habitat. It also prevents the forest from renewing itself with young trees.

It is aesthetically desirable to remove the woody debris on the ground from certain areas. For ease of access, visibility, and orderliness this is done along trails, around buildings, and other areas such as the picnic areas. It has the added benefit of decreasing the fire danger and insect infestation to manmade structures. However, like removing the understory, removal of woody debris should remain isolated and small in scale (less than ten acres). The wholesale removal of woody debris is detrimental to bird, mammal, and amphibian habitat. It also removes a significant amount of nutrients and carbon from the ecosystem.

Pruning and tree cutting can be used to improve visibility through the forest or improve visibility of a specific feature (stream, stone wall, flowering apple tree, etc.). Pruning conifers would be particularly beneficial because most conifers do not self-prune their dead branches.

BOUNDARY AND MAPS

Boundaries need to be well marked to protect the property from trespass and encroachment. The standard for marking boundaries is the use of painted blazes. A blaze is a hand-sized shallow scrape in the bark. This scrape will last for decades and does not harm the tree if done properly. When painted, this blaze is quite visible and long lasting. Trees within arm's length of the boundaries are blazed, with the blazes facing the boundary line. The blazes should be given a new coat of paint every 5 years. Custom signs can also be hung about every 100 feet to communicate anything the landowner desires. Recording the location of corner markers with a GPS unit will help to locate them again in the future. It is also recommended that understory vegetation and debris be cleared from boundary lines where adjacent to other landowners forested areas so that they can be easily traversed for inspection.

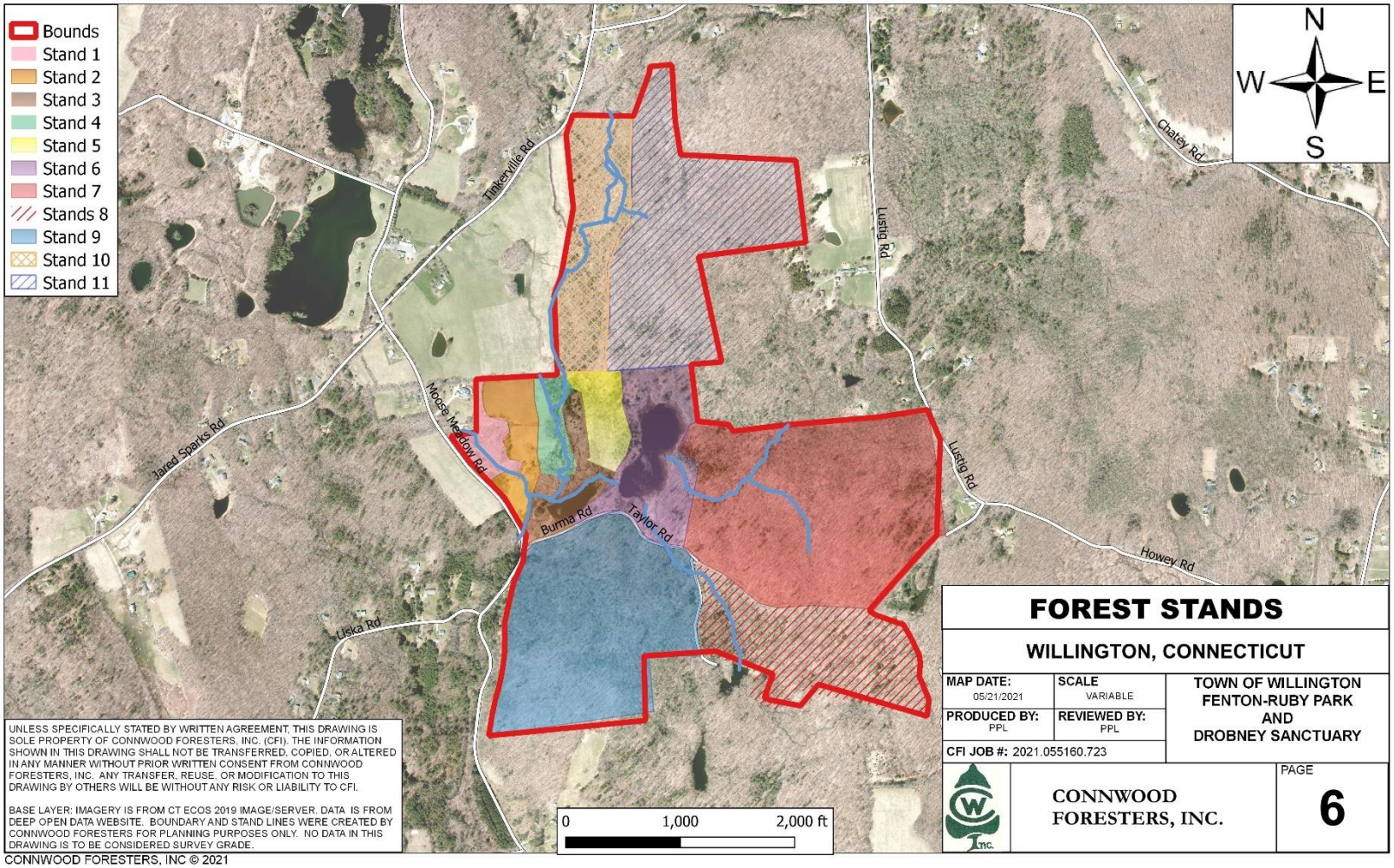
The boundary lines were hard to locate in some areas and the paint had faded in others. It is recommended that the boundaries be repainted and the GPS coordinates of the corners be recorded and mapped. This will make locating property corners and repainting of the lines easier in the future.

FOREST STAND DESCRIPTIONS AND RECOMMENDATIONS

Stands are separate natural communities that are distinct from each other. Dividing a property into stands makes it possible to logically describe the property and to manage the timber. Keep in mind that while stands are distinct, stand boundaries are often indistinct, where one stand will meld into the next stand over the course of 100 to 200 feet. Even within a single stand, there is a tremendous amount of variation. Like most properties in Connecticut, the property could be divided into an almost unlimited number of stands due to the tremendous variety forests inherently possess. Even though many stands appear to be identical, each stand was delineated by location such as natural features (streams, roads, ease of access), soils, and timber types.

The following stand descriptions are based on measurement points using a 10 BAF (basal area factor) prism with each point evenly distributed throughout the forest. At each measurement point, quantitative and qualitative data was recorded. Trees were measured at each point (species, diameter, and height). A pattern was used when walking between plots to ensure that every acre was seen.

Each description begins with two graphs. The first shows the relative abundance of each species by percent. The trees included in the sample are the trees that fall within the sampling area of the prism and are greater than 6 inches in diameter. Not all species found in a stand will be included in this graph because some of the less common species did not fall within a measurement point. The second graph shows the relative abundance of different tree sizes based on the diameter of the tree measured at 4.5 feet off the ground.



FOREST STANDS

WILLINGTON, CONNECTICUT

MAP DATE: 05/21/2021	SCALE: VARIABLE	TOWN OF WILLINGTON FENTON-RUBY PARK AND DROBNEY SANCTUARY
PRODUCED BY: PPL	REVIEWED BY: PPL	
CFI JOB #: 2021.055160.723		

CONNWOOD FORESTERS, INC.

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BASE LAYER: IMAGERY IS FROM CT ECOS 2019 IMAGE/SERVER. DATA IS FROM DEEP OPEN DATA WEBSITE. BOUNDARY AND STAND LINES WERE CREATED BY CONNWOOD FORESTERS FOR PLANNING PURPOSES ONLY. NO DATA IN THIS DRAWING IS TO BE CONSIDERED SURVEY GRADE.

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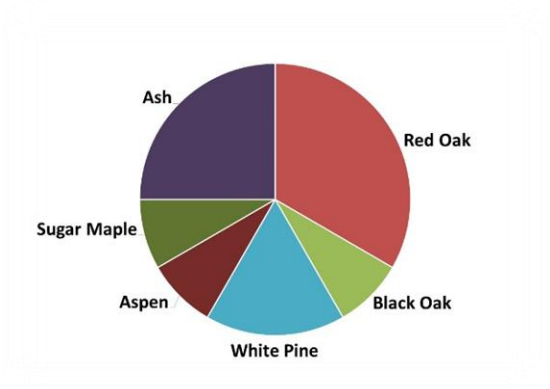
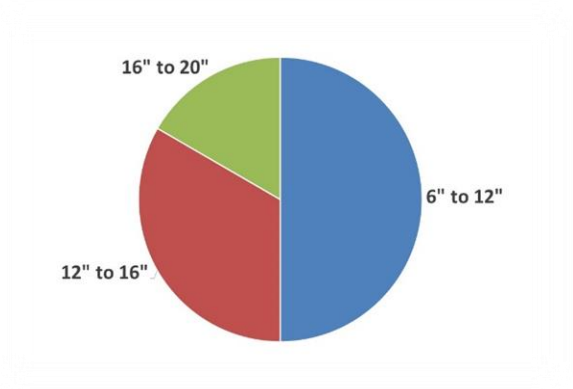
STAND 1: MIXED HARDWOODS AND PINE (5 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
10.23	60	105	2.03	68 Red Oak	51 %	84B





Other Species (not measured) Sassafras

Regeneration/Understory Sugar maple, black oak, red maple, and black cherry seedlings and saplings

Insect/Disease/Disturbance Emerald ash borer on ash

Invasives Multiflora rose, euonymus, autumn olive, and barberry bushes

%UGS 25%

Past Management None noted

This stand is in the northwestern part of the property. Moose Meadow Road is to the west, a residential house to the north, and fields to the east and south. A brook runs through the stand and eventually flows into Fenton Brook. The site is a mixture of oak, white pine, and hardwood. Many of the ash trees have been killed by the emerald ash borer. About half of the trees are pole size. The upland soils are Paxton and Montauk fine sandy loams. The soil along the brook is a poorly drained Woodbridge fine sandy loam. The current stocking is 51 % which is slightly above the C-Line on the Gingrich Stocking Table (page 49). The B-line is the point of full site occupancy with trees of maximum tree area.

The understory shrubs are mainly a mixture blueberry and blue beech with some scattered viburnums. Invasive species include multiflora rose, euonymus, autumn olive, and barberry bushes.

The stand is not at full occupancy. The majority of the trees are pole size and within the next ten years likely will grow into the small sawtimber class. At that time, the area should be reinspected for management. Timber Stand Inprovement (TSI) may then be recommended to release the crop trees and kill undesired and poorly formed trees.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
No timber management. Reexamine in 10 years	5	N/A	N/A

STAND 2: OPEN FIELD (9 ACRES)

The area is maintained as a hay field. The soils are Paxton and Montauk fine sandy loams. The open fields provide habitat for nesting birds and other wildlife. The nesting boxes were being used by swallows. Other birds were observed looking for bugs and worms along the marshy edge.

Invasives are thick around the field edge, especially autumn olive. Mowing at least once a year is recommended to control the spread of the invasives into the field. The mowing should be done after the bird nesting season. NRCS recommends that no activities be conducted between April 15 and August 15 to avoid disturbing ground nesting birds.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
Mow once a year.	9	N/A	High

STAND 3: WETLAND (10 ACRES)

This stand is a marsh with multiple beaver dams that keep the area flooded. The beavers are presently active. This marsh created by beavers provide wonderful habitat for migratory birds such as the duck and geese that were observed using the area. Deer and other mammals travel to the area for water.

The area should be maintained as a wildlife area.

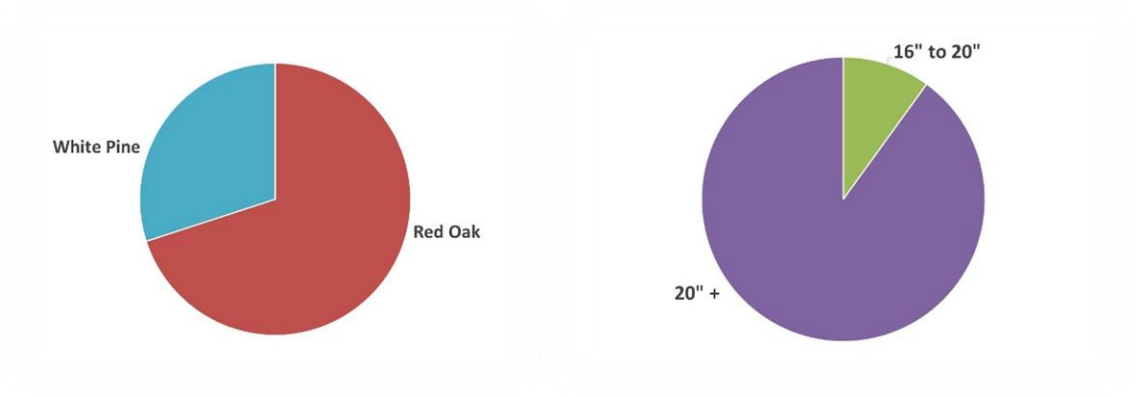
Beaver lodge (PM 52)

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
Maintain as a wildlife area.	10	N/A	High

STAND 4: MIXED HARDWOODS AND PINE (4 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
20.92	50	21	4.77	68 White Pine	35 %	13



Other Species (not measured) None noted

Regeneration/Understory White pine, black cherry, and red maple seedlings
Scattered white oak saplings

Insect/Disease/Disturbance None noted

Invasives Multiflora rose, barberry, and autumn olive bushes
Scattered bittersweet vines

%UGS 10%

Past Management None noted

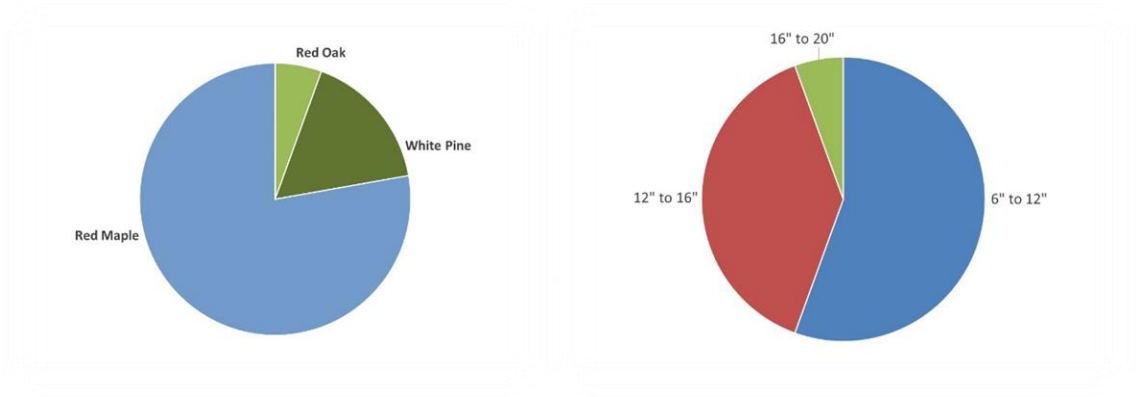
This stand is along the Fenton River and has an intermittent stream running through it. The soils are a Walpole sandy loam and are wet much of the year. Clumps of multiflora rose, and scattered barberry bushes are found growing in the moist soils. Autumn olive bushes are found along the field edge. Much of the area is flooded and only about one acre has trees growing that could be managed. No management is recommended at this time.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
No timber management.	4	N/A	N/A

STAND 5: MIXED HARDWOODS (7 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
9.59	90	179	1.76	61- 68 White Pine	78 %	13, 38C



Other Species (not measured) Hawthorn, aspen, hickory, sugar maple

Regeneration/Understory White pine, red oak, scattered white oak, hickory, and black cherry seedlings
White pine, red maple, red oak, white oak, and black cherry saplings

Insect/Disease/Disturbance None noted

Invasives/Vines Japanese barberry and multiflora rose bushes
Bittersweet vines

%UGS 17%

Past Management None noted

This stand is seasonally wet. An old oxbow of the Fenton River goes through the stand. The soils are Ridgebury, Leicester, and Whitman soil and Hinkley gravelly sandy loam. The Ridgebury, Leicester, and Whitman soils are wetland soils. Red maple is the primary specie growing in the stand. Over half of the trees are pole or small sawtimber size. Many of the white pine trees in the stand are large multi-stemmed wolf trees.

The understory is a mixture of blueberry, blue beech, serviceberry, and various viburnums. Other species noted were early azalea, bush honeysuckle, nannyberry, and alternate leaf dogwood. The herbaceous species noted were small white leeks, ferns, and a variety of grasses.

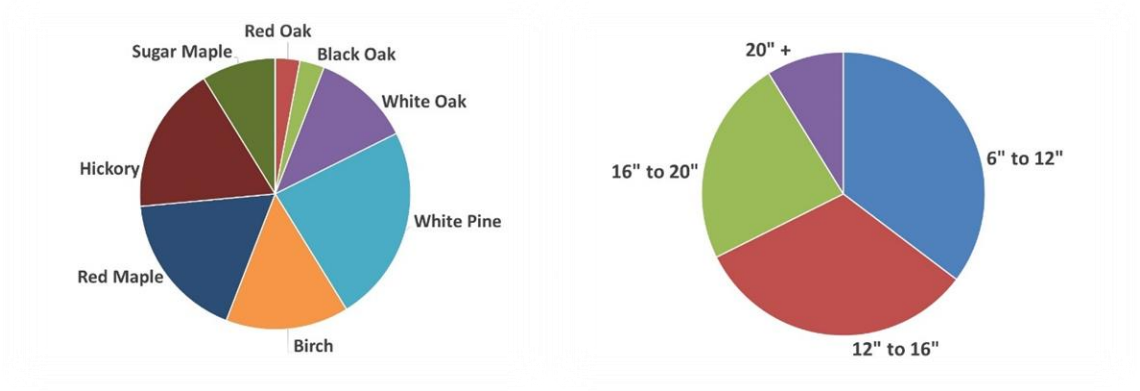
The stocking of the stand is presently at 78%. Typically, the 80% stocking level is a good midpoint to choose for adjusting an overstocked stand to a fully stocked stand. In five years, the stand should be reviewed for a TSI treatment where the desired crop trees would be released from competing trees on at least 3 sides. The desired crop trees should be healthy and well-formed pines, oaks, and hickories.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
TSI – crop tree release (5 years)	7	N/A	Moderate

STAND 6: MIXED HARDWOODS AND PINE (23 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
10.6	68	111	2.75	49-52 Red Oak	60 %	3, 39C, 51B, 61B



Other Species (not measured) Gray birch, cedar

Regeneration/Understory Beech, black cherry, red maple, sugar maple, hickory, red oak, and pine seedlings
Scattered red maple, beech, sugar maple, red oak, pine, and black cherry saplings

Insect/Disease/Disturbance White pine weevil

Invasives/Vines Euonymus, bush honeysuckle, and multiflora rose bushes

%UGS 50%

Past Management Wildlife openings created, trail markers installed, viewing areas created

This site surrounds Taylor Pond which encompasses 7.5 acres of the stand's 23 acres. There are two wildlife openings north of the pond that have a variety of species including blueberry, cedar, spirea, bush honeysuckle, hawthorn, juniper, blue beech, and hophornbeam. Multiflora rose and euonymus bushes can be found scattered throughout.

Many of the pine trees have multiple tops from past attack from the white pine weevil. These pines were likely the earliest trees to begin growing in the area and when young and in the sun, the weevil will lay its eggs on the main leader. The larva will girdle the leader as they eat the soft growing layer of the stem. New leaders will form causing multiple and crooked stems.

The stocking level is at 60% which is slightly above the B-line. The B-line is the point of full site occupancy with trees of maximum tree area. A stand on the B-line is thought to have trees with no competition, yet no space wasted. The soils are a mixture of Ridgebury, Leicester, and Whitman soil around the wetlands and pond, Hinckley loamy sand, and Canton and Charlton fine sandy loams in the uplands.

Beaver dam on Taylor Pond (PM 41)

Eastern wildlife opening (PM 48)

The openings should be maintained as early successional habitat. It is recommended that these openings be periodically cleared with a brushsaw to maintain early successional vegetation. Native conifers and shrubs valuable for wildlife could be released from unwanted competition to improve the habitat value as well as planting some native pollinators for bees and butterflies. Building brush piles in the openings will provide cover for small mammals and birds. Snags can be created by girdling trees around the openings.

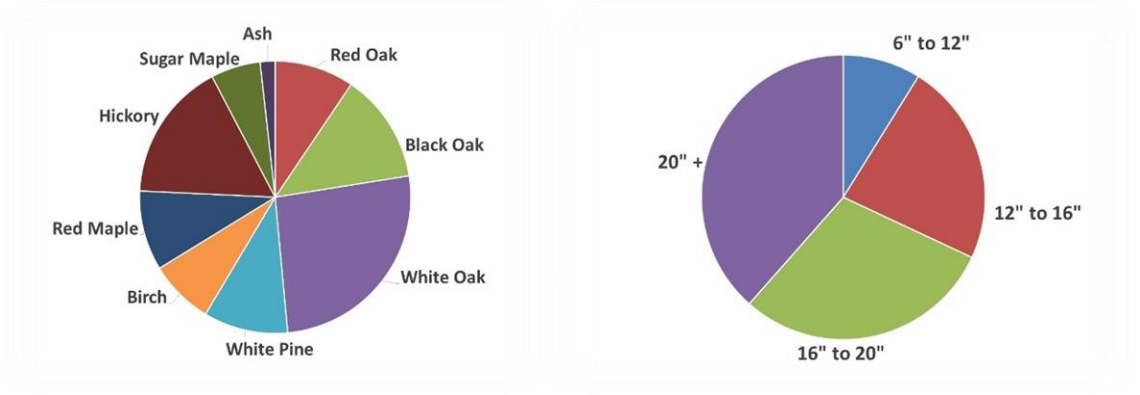
The trails and viewing areas should be maintained. Brush should be cut back, and bridges, benches, and chairs repaired as needed.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
Mow early successional openings.	2	N/A	Moderate
Maintain trails, benches, and chairs	23	N/A	Moderate

STAND 7: MIXED HARDWOODS (74 acres)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
14.7	89	75	7.87	52-65 Red Oak	69 %	3, 46B, 51B, 61B, 61C, 62C, 72C



Other Species (not measured) Hemlock

Regeneration/Understory Red maple, black cherry, sugar maple, beech, black oak, and birch seedlings
Red maple, sugar maple, birch, hickory, and pine saplings

Insect/Disease/Disturbance Emerald ash borer

Invasives/Vines Japanese barberry and barberry bushes

%UGS 14%

Past Management None noted

This stand is dominated by red, black, and white oak. Hickory, sugar maple, and pines are scattered throughout. The current stocking of the stand is 65%. This is slightly above the B-line. The B-line is the point of full site occupancy with trees of maximum tree area. A stand on the B-line is thought to have trees with no competition, yet no space wasted. The soils are a mixture of Ridgebury, Leicester, and Whitman soils, Woodbridge fine sandy loam, Sutton fine sandy loam, Canton and Charlton fine sandy loams.

Many of the ash trees have died from the emerald ash borer. A few trees are still alive but will likely be attacked and die. Pockets of thick mountain laurel can be found. The understory is composed of serviceberry, blue beech, blueberry, witch hazel and other viburnums. A perennial stream meanders through the center of the stand from the northeast to the west, discharging into Taylor Pond.

Brush pile (PM 24)

Trail signs (PM 26)

The Ruby Trail meanders around the perimeter of this stand and is connected to the Taylor Pond Trail by a short connector trail. Another side trail goes out to Lustig Road and connects to the trails on Langhammer Town Forest. While walking the area a brush pile was observed near Lustig Road. Birds were flying in an out of the openings in the brush.

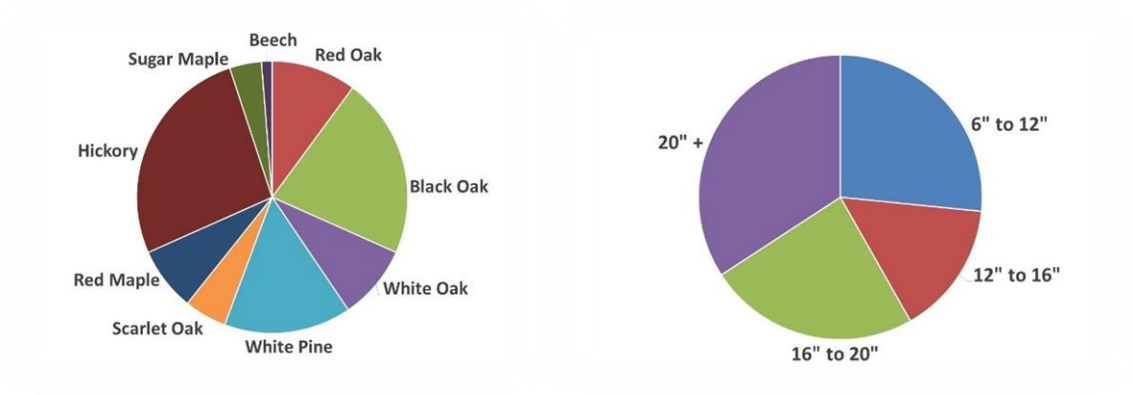
This stand can be thinned, and future crop trees released. Roughly a third of the sawtimber would be cut and the residual trees would be good quality oak, sugar maple, and white pine trees left to drop their seeds and regenerate the stand. The removal of the poor-quality trees would give the crop trees sufficient room to grow for the next ten to fifteen years. Three wildlife cuts of ½ acre and a brush pile in each clearing would benefit the wildlife.

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
Timber harvest – thinning and release of future crop trees.	72.5	2.0 MBF	Moderate
Create 3 early successional habitat openings of ½ acre with brush piles	1.5	7.87 MBF	Moderate

STAND 8: MIXED HARDWOODS AND PINE (33 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
11.62	88	115	6.42	65 Red Oak	65 %	3, 61C, 62C, 72E



Other Species (not measured)	Aspen
Regeneration/Understory	Birch, red maple, pine, white oak, sugar maple seedlings White pine, white oak, red maple, sugar maple, and hemlock saplings
Insect/Disease/Disturbance	Emerald ash borer
Invasives/Vines	Multiflora rose and barberry bushes
%UGS	12%
Past Management	18 acres harvested in 2016

This stand is in the southeastern portion of the property. Eighteen acres of this was harvested in 2016. Prior to the harvest, forestry consultants noted that the trees were overcrowded, and *the conditions observed, and the information collected, a silvicultural treatment aimed at preparing for the natural establishment of the next forest was recommended. A shelterwood harvest was employed to capture some of the potential revenue from those trees most at risk from further decline or mortality while reserving the superior trees of all species to serve as a seed source and shelter for the young trees we hope to establish* (**Inventory, Silvicultural Prescription and Harvest Operational Plan Fenton-Ruby Park and Wildlife Preserve Park Management Unit 08 Prepared by: Natural Resource Consultants LLC**).

The soils are Ridgebury, Leicester, and Whitman soils, Canton and Charlton fine sandy loams, Nipmuck-Brookfield complex. The present stocking is 65% which is above the B-line. The B-line is the point of full site occupancy with trees of maximum tree area. The stand is healthy except for the ash trees that have been killed by the emerald ash borer. The area that was thinned did not regenerate as hoped. This could be due to the high population of deer that eat the young growth. This stand is currently well stocked and should be allowed to grow for the next 10 years. At that time the area should be reexamined, and another regeneration cut may be recommended.

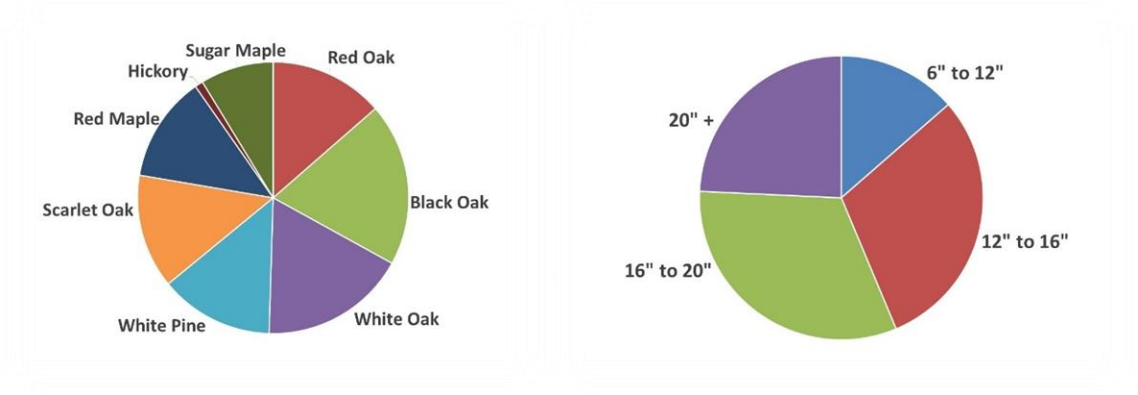
Sedges and grasses in understory (PM 6)

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
No timber management	33	N/A	N/A

STAND 9: MIXED HARDWOODS AND PINE (60 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
13.09	94	100	7.93	65 Red Oak	75 %	61C, 72C, 72E



Other Species (not measured)	Black cherry, birch, beech
Regeneration/Understory	Hemlock, white oak, beech, sugar maple, and birch seedlings Red maple, birch, sugar maple, white pine, hickory, and red oak
Insect/Disease/Disturbance	Broken tops from past storm damage
Invasives/Vines	Thick patches of mountain laurel Scattered multiflora rose bushes
%UGS	12%
Past Management	None noted

This stand is in the southwestern portion of the property. The Weigold Trail loops through the area. The understory is dense mountain laurel in the central and northwestern portion of the area. Other species in the understory were witch hazel, maple leaf viburnum, blueberry, huckleberry, blue beech, and hophornbeam. Many of the black oaks are showing crown dieback and decay. Several wind and snowstorms have broken tree limbs and uprooted trees. The current stocking is 75% and regeneration is scattered. The soils are Canton and Charlton fine sandy loams and Nipmuck-Brookfield complex.

This stand resembles Stand 8 in the growth, regeneration, and overall health. Given the conditions observed a treatment aimed at the regeneration the next forest is recommended. A shelterwood harvest would remove those trees most at risk from further decline or mortality while reserving the healthiest trees to serve as a seed source and shelter for the young trees. Shelterwood harvests are intended to establish a new young class of trees to eventually become the new forest canopy. This recommended harvest should be marked so that a buffer strip of at least 50 feet is retained on either side of the Weigold Trail.

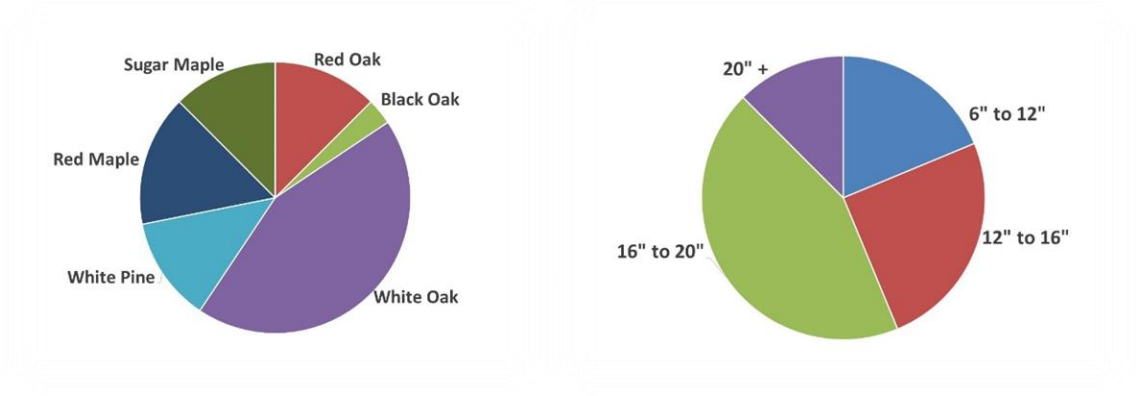
Understory of mountain laurel (PM 2)

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
Shelterwood harvest	60	2.0 MBF	Moderate

STAND 10: MIXED HARDWOODS AND PINE (25 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
11.2	80	117	5.4	65-72 Red Oak	69 %	3, 38B, 47C, 50A, 86D



Other Species (not measured) Elm, birch

Regeneration/Understory Black cherry, red maple, sugar maple, red oak, and white oak seedlings
Sugar maple, red maple, white pine, and elm saplings

Insect/Disease/Disturbance None noted

Invasives/Vines None noted

%UGS 16%

Past Management None noted

This site is on the northwest side of the property. The soils are Ridgebury, Leicester, and Whitman soils, Hinckley loamy sand, Woodbridge fine sandy loam, Sutton fine sandy loam, and Paxton and Montauk fine sandy loams. The Fenton River runs through the stand and there are two vernal pools in the north. Much of the area is seasonally wet. Portions of Julia's Trail wind through this stand.

The sawtimber trees are good quality but most are small to medium size. There are scattered seedlings throughout. Because this area has the Fenton River flowing through it and the area serves as a buffer to protect the river, no management is recommended.

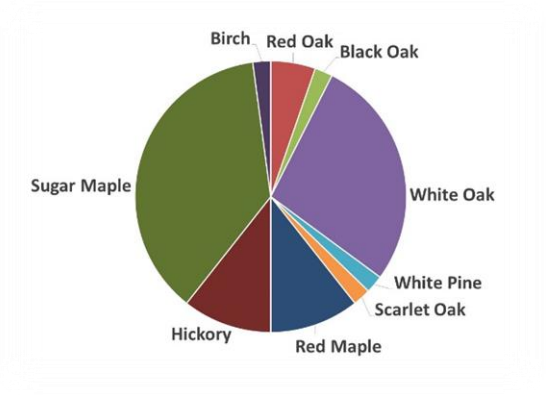
Skunk cabbage (PM 46)

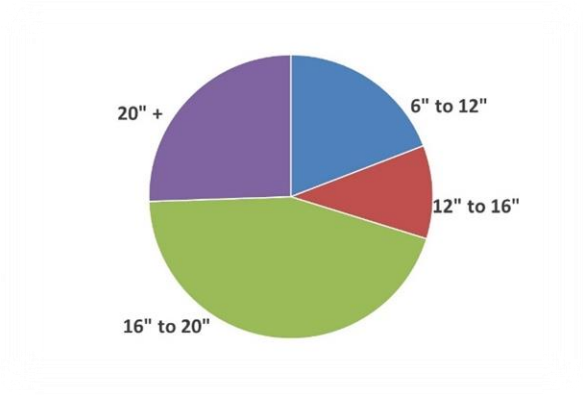
RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
No management	25	N/A	N/A

STAND 11: MIXED HARDWOODS (54 ACRES)

MSD (in)	BA/Ac	Trees/Ac	Vol/Ac (mbf)	Site Index	Stocking	Soils
13.78	72	70	5.8	65-72 Red Oak	58 %	3, 38C, 45B, 47C, 51B, 86D





Other Species (not measured) White birch

Regeneration/Understory Black cherry, red maple, sugar maple, black oak, and white oak seedlings
Sugar maple, birch, red maple, and red oak saplings

Insect/Disease/Disturbance Emerald ash borer
Logging damage

Invasives/Vines Barberry, multiflora rose, and euonymus bushes
Scattered bittersweet vines

%UGS 14%

Past Management Area was logged in the past

This site is on the northeastern side of the property. The soils are Ridgebury, Leicester, and Whitman soils, Hinckley loamy sand, Woodbridge fine sandy loam, Sutton fine sandy loam, and Paxton and Montauk fine sandy loams. The quality of the trees is good, and the stocking level is at the B-line. The B-line is the point of full site occupancy with trees of maximum tree area. The emerald ash borer has killed the majority of the ash trees growing in the area. Sugar maple and white oak are the two main species growing on this site. The understory has pocket of thick blue beech. Other species noted were serviceberry, blueberry, witch hazel, hophornbeam, mountain laurel, and various viburnums. Portions of Julia's Trail wind through this stand.

The trees on this site are growing well and the site is fully occupied. No management is recommended for the next 10 years.

Logging damage (PM 39)

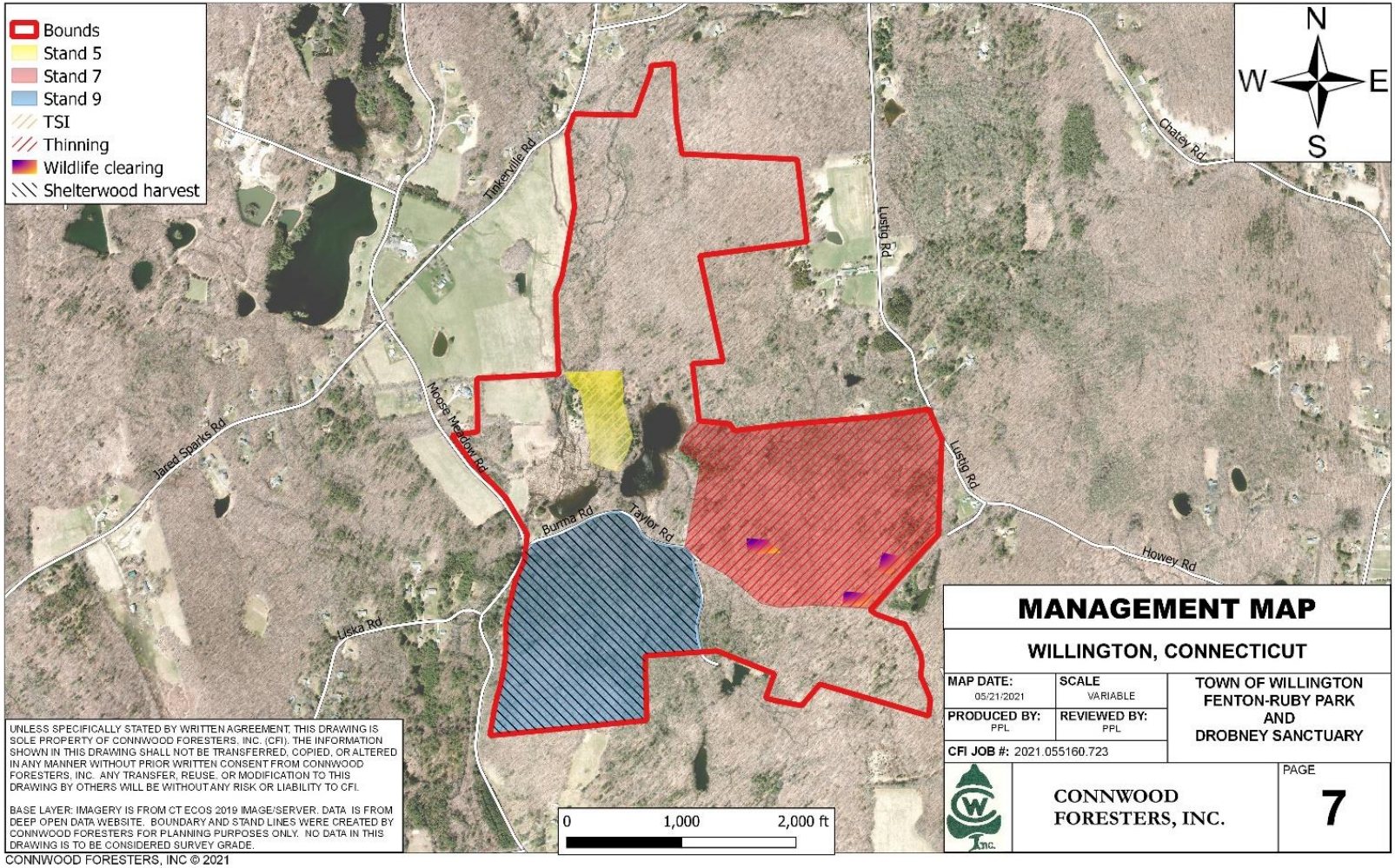
Thick blue beech (PM 11)

RECOMMENDED MANAGEMENT PRACTICES FOR THE NEXT 10 YEARS

Treatment	Area (acres)	Volume/acre to be harvested	Priority
No management	54	N/A	N/A

FOREST MANAGEMENT – RECOMMENDED TREATMENTS

Management Unit	Forested Acres	Forest Treatment	Year
Stand 1	5	Reexamine in 10 years for TSI - crop tree release	2031
Stand 2	9	Mow field once a year	Yearly
Stand 3	10	No treatment	
Stand 4	4	No treatment	
Stand 5	7	TSI – crop tree release in 5 years	2026
Stand 6	23	Mow early wildlife clearings	2023
Stand 7	72.5	Timber harvest - thinning	2028
	1.5	Create 3 wildlife openings of ½ acre each	2028
Stand 8	33	No treatment	
Stand 9	60	Shelterwood harvest	2022
Stand 10	25	No treatment	
Stand 11	54	No treatment	
All	All	Update boundary lines	2021
All	All	Maintain trails	Yearly
All	All	Manage invasives	Yearly


Bounds
Stand 5
Stand 7
Stand 9
TSI
Thinning
Wildlife clearing
Shelterwood harvest
N
W
E
S
Tinkerville Rd
Chatey Rd
Lustig Rd
Jared Sparks Rd
Moose Meadow Rd
Burma Rd
Taylor Rd
Howey Rd
Lieka Rd
0
1,000
2,000 ft
MANAGEMENT MAP
WILLINGTON, CONNECTICUT
MAP DATE: 05/21/2021
SCALE VARIABLE
PRODUCED BY: PPL
REVIEWED BY: PPL
CFI JOB #: 2021.055160.723
TOWN OF WILLINGTON
FENTON-RUBY PARK
AND
DROBNEY SANCTUARY
CONNWOOD FORESTERS, INC.
PAGE 7
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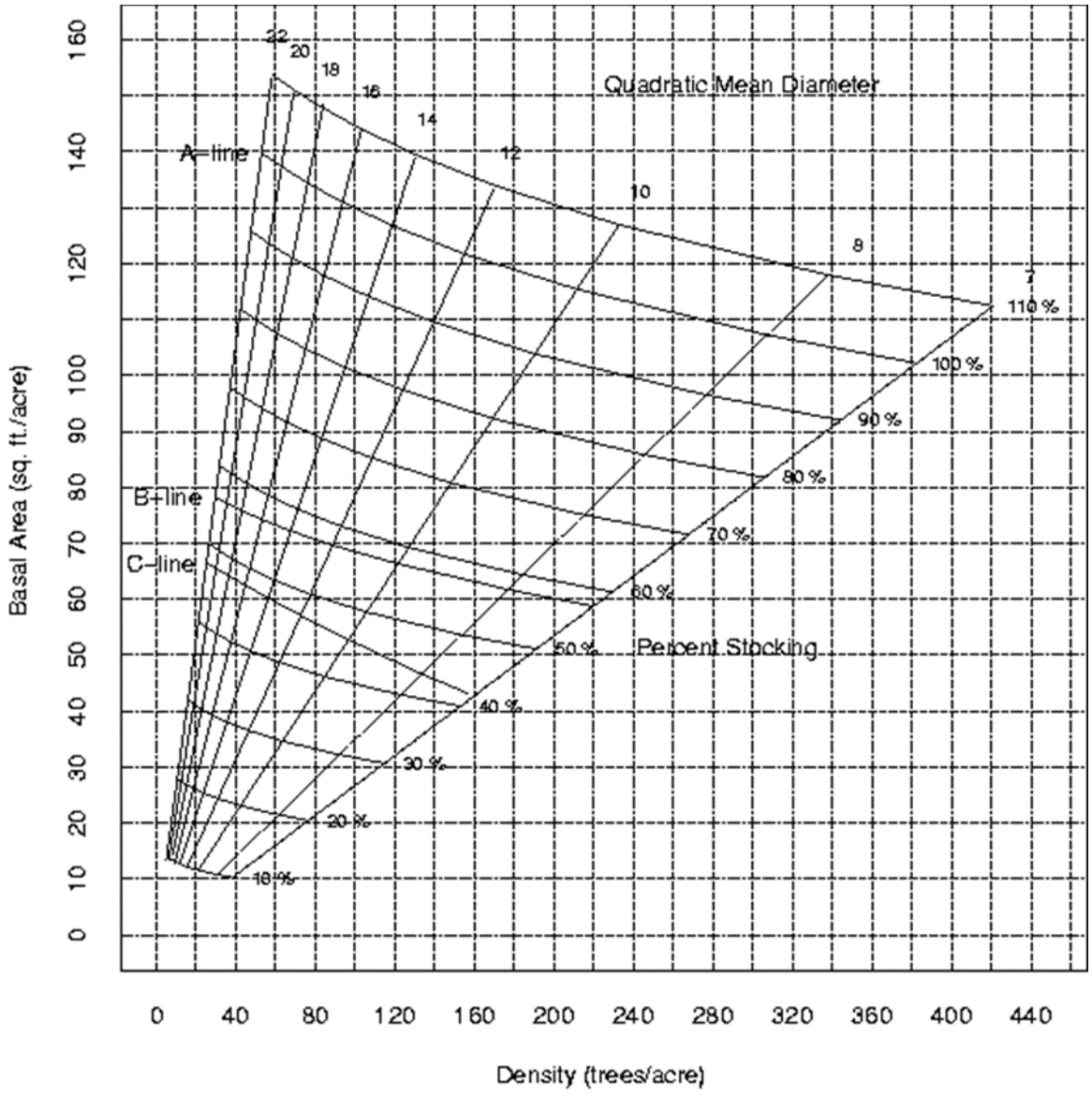
GINGRICH STOCKING GUIDE



Source: Gingrich, S. F. 1967. Measuring and evaluating stocking and stand density in Upland Hardwood forests in the Central States. For. Sci. 13:38-53.)

The diagram illustrates the relationship between basal area per acre, density (trees per acres), and the diameter of the tree of average basal area: • The A-line is based on a fully stocked stand that has never been thinned. Trees in stands above 100% are considered crowded, too slow growing for normal forest management, and overstocked. • The B-line is the point of full site occupancy with trees of maximum tree area. A stand on the B-line is thought to have trees with no competition, yet no space wasted. The area between the A-line and the B-line indicates the range of stocking where trees can fully utilize the site and should be considered fully stocked. Typically, the 80% stocking level is a good midpoint to choose for adjusting an overstocked stand to a fully stocked stand. This is because opening the stand too much (down to the B-line) could cause windfall or adverse effects. The C-line is an estimate based on normal yield table of the lowest stocking that will grow to the B-line within ten years. This area of the chart is considered understocked.

Trees and Shrubs

Red oak – Quercus rubra
Black oak – Quercus velutina
Scarlet oak – Quercus coccinea
White oak – Quercus alba
Chestnut oak – Quercus montana
Black birch – Betula lenta
Beech – Fagus grandifolia
Hickory – Carya spp.
Hemlock – Tsuga canadensis
Spruce – Picea spp.
Blueberry – Vaccinium corymbosum
Sassafras – Sassafras albidum
Red maple – Acer rubrum
Sugar maple – Acer saccarum
White pine – Pinus strobus
Aspen – Poplus spp.
Hophornbeam – Ostrya virginiana
Spicebush - Lindera benzoin
Viburnum – Viburnum spp.
Red cedar - Juniperus virginiana
Witch hazel - Hamamelis virginiana
Serviceberry - Amelanchier spp
Blue beech - Carpinus caroliniana
Hawthorn - Crataegus monogyna
Bush honeysuckle - Diervilla spp
Spirea - Spiraea spp
Juniper - Juniperus communis
Alternate leaf dogwood - Cornus alternifolia
Early azalea - Rhododendron prinophyllum
Nannyberry - Viburnum lentago
Huckleberry - Vaccinium ovatum
Gray birch - Betula populifolia
Black cherry - Prunus serotina

INVASIVE PLANTS

Japanese barberry – Berbeeris thunbergii
Oriental bittersweet - Celastrus orbiculatus
Burning bush – Euonymous spp.
Autumn olive - Elaeagnus umbellate

BIRDS SIGHTED

Red-winged blackbird
Goldfinch
Hairy woodpecker
Downy woodpecker
Piliated woodpecker
Yellow-bellied sapsucker
Black-capped chickadee
Tufted titmouse
Coopers hawk
Blue jay
White-throated sparrow
Mallard
Raven
Mourning dove
Turkey vulture
Nuthatch
Blue heron
Oriole
Ruby throated hummingbird
Crow
Turkey

Definitions of Forestry Terms

AGS: Acceptable Growing Stock: Trees desirable for long-term growth/**UGS**: Undesirable Growing Stock

Basal Area: The area in square feet of the cross section of a tree at DBH

Board foot: Wood used for lumber that measures 1"x 12"x 12" (**MBF** = 1000 board feet)

Canopy: Where the leaves and upper branches in a tree are located

DBH: Diameter at Breast Height: diameter of a tree at 4.5' above the ground

Girdling: Creates a cut area around the circumference of the tree that blocks the flow of food

Habitat: The foods, water, cover, and living space wildlife needs for survival

Hardwood: Broad-leaved trees that usually shed their leaves in the fall

Intermittent (seasonal) Stream: A small stream that usually does not flow all year

Mast: Tree seeds that supply valuable wildlife nutrition; Hard: acorns, nuts; Soft: berries

MSD: Mean Stand Diameter

Overstory: Upper canopy of treetops

Pole or Poletimber: Trees having a DBH of 6 to 12 inches

Regeneration: New young trees

Release: Remove competition such that the released tree has more sunlight and growing space

Sapling: Trees having a DBH of 1 to 6 inches

Sawtimber or Sawlog: Trees having a DBH greater than 12 inches

Seedling: Trees having a DBH less than 1 inch

Silviculture: The art, science, and practice of producing and tending a forest

Site Index: The relative productivity of a site. Site index is the height of a "free to grow" tree of a given species at a base age on the site of interest. Common base ages include 25, 50, and 100, depending on the lifespan and common management practices for that species.

Snag: A dead standing tree

Stand: Separate and distinct natural community

Understory: Vegetation layer below the upper canopy of treetops

Timber Stand Improvement (TSI): Precommercial thinning where trees that have little or no value are killed or removed

POINT SAMPLING MAP

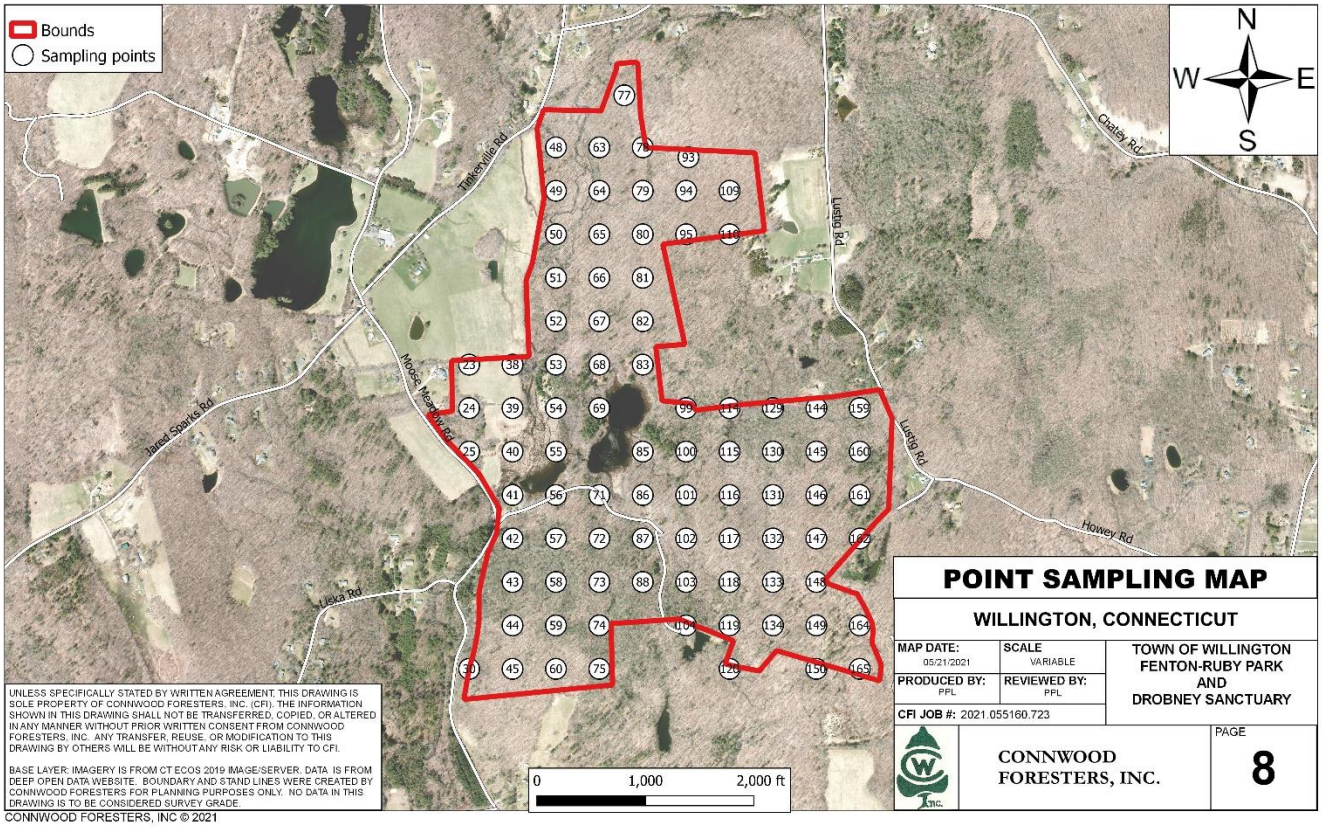
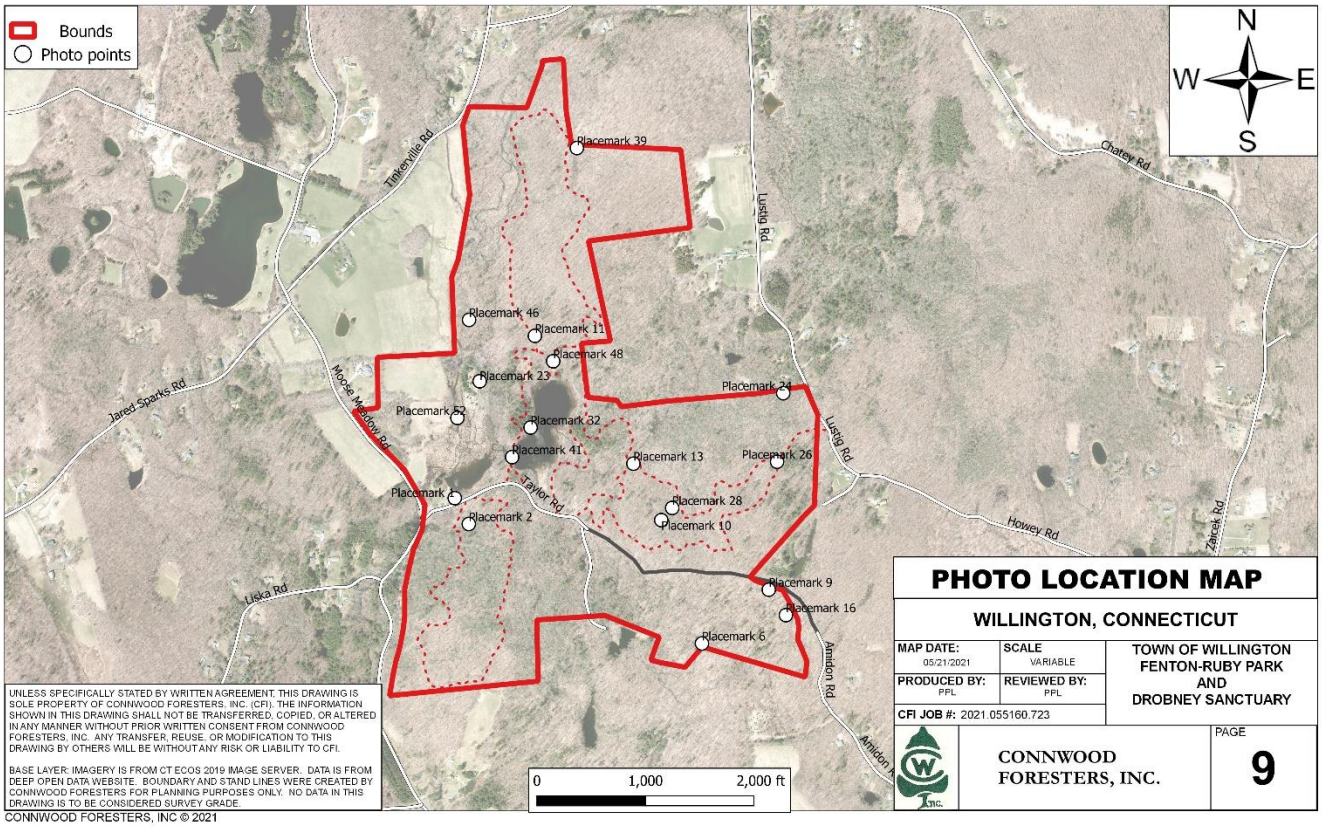


PHOTO LOCATION MAP



Southern New England Forest Management in an Era of Climate Change

A Position of the Yankee Division of the Society of American Foresters

Purpose: This document reports the best available scientific findings and management strategies related to forests and carbon sequestration and storage in southern New England. This information will help guide development of public policy for forest management in this region. Forests are central to our history, identity and way of life. The forests of southern New England provide critical ecosystem services, globally important products, and essential jobs, while providing solace and sense of place. Climate change, coupled with New England's land use history and increasing human population, has heightened the need to wisely manage these forests for multiple uses, including sequestration and storage of atmospheric carbon.

Scope: This statement outlines the ways in which forest management in southern New England contributes to climate change mitigation and adaptation, provides services and products for society, and sustains resilient forests for future generations.

Position

It is the position of the Yankee Division of the Society of American Foresters (Yankee SAF) that active forest management, grounded in science, is essential to maintaining and promoting resiliency and ecosystem services. Such management will:

1) Promote carbon sequestration and storage (Evans and Perschel 2009, McGarvey et al. 2015);
2) Provide additional ecosystem services including air and water pollution mitigation and others (Cardinale et al. 2012);
3) Provide locally sourced and sustainable wood products that substitute for more carbon intensive materials (e.g., wood instead of concrete, biomass fuels instead of fossil fuels) (Rudell et al. 2007);
4) Reduce forest fragmentation, mismanagement, and conversion to non-forest both locally and globally; and
5) Improve biodiversity and the capacity of ecosystems in southern New England to withstand and adapt to the impacts of climate change.

Issue

The issue of forests and carbon is complex and increasingly important. Carbon uptake (i.e., sequestration) occurs in growing forests, generally peaking in early stand development, but sometimes continuing at high rates through late-successional stages, particularly in structurally complex forest systems (Bormann and Likens 1979, Keeton et al. 2007, Keeton et al. 2011). Carbon storage occurs in the biomass of forested systems and in long-lasting wood products, such as lumber.

Wood products help to offset the need for mining and production of non-renewable, carbon-intensive materials, such as concrete, steel and petroleum-based plastics. Locally and regionally produced wood products have a relatively smaller carbon footprint due to lower transportation costs and are sourced from well-regulated forests (Kittredge et al 2002, Ashton et al. 2012).

Forest management, including timber harvesting, is consistent with goals of promoting long-term carbon sequestration and storage. Management practices continue to adapt as we gain a better understanding of the relationships between forestry and atmospheric carbon. Reducing harvest frequency and favoring high levels of structural retention, for example, can sequester up to 57% more carbon (Nunery and Keeton 2010). Reforestation also increases carbon sequestration (Rhemtulla et al. 2009). In urban areas this would also improve quality of life through other ecosystem services (Nowak and Greenfield 2008). Managing for a variety of values and uses on a long-term timescale using peer-reviewed forest science and a holistic understanding of the forest systems, ensures that southern New England forests continue to capture and store carbon, maintain ecosystem functions and services, and decrease global deforestation and fossil fuel use.

Background

The Importance of Forests

Forests are central to our history, identity, and way of life. The health of our forests will strongly influence our collective future. Forests renew the air we breathe and filter the water we drink. We rely on forests for a host of renewable raw materials for products from maple syrup and medicinal plants to fuel and lumber. Forests provide habitat to wildlife, beneficial insects and plant species. Forests prevent erosion, build soil, store nutrients, and sequester and store carbon. Forests also provide the joy of birdsong, inspiration and renewal of spirit.

Forest Disturbance and the Need for Resilience

Disturbances play an important role in structuring the forested landscape and are vital for functions including regeneration. Disturbances range in type, size, frequency and intensity (Turner et al. 1998, Lorimer and White 2003). Variation in post-disturbance abundance and spatial arrangement of live and dead trees impacts species composition and carbon storage dynamics (Franklin et al. 2002, Seymour et al. 2002, Birdsey 2019).

While the most common natural disturbances in Southern New England forests are wind and ice storms, impacts of invasive insects and fungal diseases are increasing. Anthropogenic

disturbance (e.g., harvesting and silvicultural action) has also been an influential driver of forest condition, and response to decades of forest management is one of the largest factors shaping current forest conditions (Duveneck et al. 2017).

Climate change in the Northeast is altering ecosystem disturbance regimes (Evans and Perschel 2009). Changes vary seasonally and include increases to average temperatures, heavy precipitation events and drought, and decreases in snowfall and snowpack (Janowiak et al. 2018). Forest composition and condition models show varying responses to changes in climate and natural disturbance regimes (Tang and Beckage, 2010, Rustad et al., 2012). The impacts may happen at such a rate that the forest ecosystem cannot keep pace in its recovery (Liang et al., 2017), or to cause substantial loss of species richness and diversity (Iverson and Prasad, 2001). At the same time, the landscape is facing loss of forests through conversion to other land uses (Kittredge, 2009, Olofsson et al. 2016).

Resiliency – a forest's capacity to recover function after a disturbance – is critically important for sustaining forest ecosystems in this era of rapidly changing climatic conditions. Resiliency enables ecosystem services, including carbon sequestration and storage, to be maintained, restored, or enhanced following disturbances. Informed forest management and protecting forestland from development will maintain or improve resiliency by retaining connectivity, increasing complexity and maintaining or enhancing diversity across forested landscapes (Catanzaro and D'Amato, 2019).

Forest Carbon

Forested ecosystems provide a valuable ecosystem service by storing and sequestering carbon, reducing atmospheric inputs of CO_2. In fact, temperate forest ecosystems have been widely acknowledged as a carbon sink (Ashton et al. 2012), with U.S. terrestrial forests offsetting ten to thirty percent of annual U.S. CO_2 emissions (Houghton 2003).

Trees and forest vegetation sequester carbon from the atmosphere through the process of photosynthesis. Carbon is stored in various pools including live and dead aboveground biomass, belowground biomass, woody material and leaf litter, and soil (Fahey et al., 2005; Catanzaro and D'Amato, 2019). Amounts of sequestered and stored carbon are dynamic – constantly fluxing between and within pools as forests and land-use change over time. Decades of research illuminate the variety of factors driving forest carbon sequestration and storage dynamics. Stand age is strongly predictive of aboveground biomass in the U.S. Northeast, with other variables, including ecoregion and conifer composition, accounting for 25-33% of variability (Keeton et al. 2011). Disturbance, both natural and anthropogenic, is also a driving factor of carbon sequestration and storage dynamics (Birdsey et al. 1997, Duveneck et al. 2017).

Reports of carbon sequestration and storage vary widely due to these factors. In the Northeast, biomass (i.e., stored carbon) generally increases over time (Barford et al. 2001, Hadley and Schedlbauer 2002, Keeton et al. 2011), but can exhibit decline in different stand conditions or due to stressors (Fahey et al. 2005).

The rate in forest carbon uptake (i.e., sequestration) in the Northeast is declining (Birdsey et al. 2019), as has been observed in maturing forests (Bormann and Likens 1979, Keeton et al. 2007). However, managing for complex forest structure, as often found in primary and mature or old-growth secondary forests, can yield an increase or maintenance in net carbon sequestration (Luyssaert et al. 2008, Nunery and Keeton 2010).

The carbon stored in wood products adds to the complexity of carbon accounting. Hardwood flooring, dimension lumber, and plywood are forms of stored carbon and furthermore avoid carbon emissions from the extraction and production of more carbon-intensive materials such as vinyl, carpet, concrete, and steel (Oliver et al. 2014). Wood utilization and technology continue to improve the production of wood products and increase associated carbon storage (Tollefson 2017). Cross-laminated timber is capable of replacing concrete for multi-story buildings (Robertson et al. 2012). A life cycle assessment of the four-story John W. Olver building at the University of Massachusetts found that the use of CLT and other wood products instead of concrete and steel reduced the building's global warming potential by 13% (Gu and Bergman 2018). Substituting wood for steel and concrete in new buildings world-wide would reduce global CO_2 emissions by 14 to 31% (Oliver 2014) and interest in this technology is rising (Struck 2019).

Sequestration in the forest and carbon emission offsets associated with wood products from sustainable forest management are critical components of carbon management. Research continues to increase our understanding and must guide forest practitioners to improving the capacity of this vital resource.

Sustainable Forest Management and Timber Harvesting

Sustainable forest management is a "dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations" (FAO 2020). Yankee SAF strongly supports the practice of sustainable forest management. FAO lists the following climate change mitigation and adaptation actions for forests:

- Carbon sequestration enhancement by silvicultural practices
- Carbon stock conservation by preventing deforestation, implementing reduced impact logging, and pest control
- Substitution of wood products for steel, concrete, aluminum, and plastic
- Reducing the vulnerability and strengthening the adaptive capacity of trees and forests.

Sustainable forest management can accelerate development of complex structure in northeastern U.S. forests (Keeton 2006), making it possible for early successional canopies to support the complex functioning and biodiversity seen in late-successional or old-growth forests (Donato et al. 2012). Reducing harvesting frequency (Curtis 1997), increasing rotation lengths (Harmon and Marks 2002, Ryan et al. 2010), and encouraging post-harvest structural complexity (Keeton 2006, Franklin et al. 2007, Swanson 2009, Puettmann et al. 2009) have been found to increase

stand-level carbon storage. Maintaining adequate stocking of large trees (Stephenson et al. 2014), while also allocating growing space for younger trees can promote higher rates of stand-level carbon storage and sequestration (D'Amato et al. 2011). These practices can also strengthen forest resiliency.

Sustainable forest management promotes diversity of species, ages, sizes, and spacing of trees, improving overall forest resilience. A gypsy moth outbreak that kills large oak trees will not harm tulip trees. A hurricane or tornado that flattens mature trees will not damage saplings that bend more readily. A drought can weaken or kill overcrowded trees but has less impact on trees freed from competition through active management.

Managing forests to promote resiliency and greater carbon storage is stand-specific. Sustainable forest management considers many different tree and site characteristics to determine the most suitable actions to meet the goals of forest management. Certain management prescriptions' effects on carbon sequestration and storage, for example, are dependent on stand age characteristics. Reducing harvest frequency more effectively increases carbon sequestration in uneven-aged New England stands than in even-aged stands (Nunery and Keeton 2010). Retaining biological legacies also promotes diversity by sustaining many organisms and critical ecosystem functions, such as soil stabilization, nutrient retention and recycling, and resilience to disturbance (Franklin et al. 2007, Hanson et al. 2012). Generally, silvicultural treatments that maintain a large proportion of mature trees maintain or increase aboveground carbon storage (D'Amato et al. 2011).

Sustainable forest management that includes harvesting reduces the volume of dead wood that will release carbon due to decay (Hoover and Stout 2007). The carbon in durable wood products such as plywood, framing, flooring and furniture is stored much longer than the carbon in dead trees (Russell 2014). In southern New England, the volume of wood in trees that die naturally is over three times that contained in harvested trees (Oswalt et al. 2019).

Durable wood products are more carbon-efficient than alternative products, in addition to storing sequestered carbon that would otherwise be released back to the atmosphere through decay. The carbon released from harvesting and manufacturing wood products is less than the carbon released in the mining of non-renewable resources and manufacturing of products from them (Bergman et al. 2014). Many studies have documented that one of the key carbon sequestration benefits of active forest management is the substitution of products made from wood for those made from steel, aluminum, or concrete (Oliver 2014, Woodbury and Wightman, 2017). In 2013, Southern New England's forest based economy accounted for an estimated $5.8 billion dollars in gross regional output and provided employment to approximately 28,525 individuals (Northeast State Foresters Association 2015). In addition, revenue generated from the sale of forest products helps encourage keeping forests as forests and limiting their conversion to non-forest uses.

A resilient forested landscape is comprised of a variety of forest conditions. Sustainable forest management and management to preserve old forests each result in the storage of significant

amounts of carbon. Minimally disturbed forests provide critical habitat for some species and are invaluable for scientific research. Forest management that includes harvesting can proactively and intentionally create or enhance habitat for the myriad vertebrate and invertebrate species that depend on young forests or forests with heterogenic structure (DeGraaf and Rudis 1992, DeGraaf et al. 2005). Sustainable forest management yields additional benefits for useful, renewable products, reduced carbon emissions, and important aspects of resilience that preservation does not.

Resilient, vigorous, functional and diverse forests are critical for continuing our way of life in southern New England. The disturbance regime that our forests experience has changed due to the loss of some species (including apex predators), the introduction of others (especially invasive species), and a changing climate. Sustainable forest management maintains and enhances ecosystem function and resiliency so that the forest resource continues to meet societal needs. Water quality, soil integrity, carbon capture, diverse wildlife habitat, forest products, recreational opportunities, and aesthetic beauty can be maintained or increased. We have the opportunity and the responsibility to be a part of the solution.

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Connecticut Department of
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July 2, 2021

Peter Lesmerises
Connwood Foresters, INC
PO Box 150
Rockfall, CT 06481
Peter@connwood.com

NDDB DETERMINATION NUMBER: 202107992

Project: Forest stewardship plan, Fenton-Ruby Park and Drobney Sanctuary - Willington, CT

Expiration: July 2, 2023

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding the project. According to our records, there are State-listed species (RCSA Sec. 26-306) documented within or nearby the proposed area.

Wood turtle *(Glyptemys insculpta)* – State special concern
Individuals of this species are riverine and riparian obligates, overwintering and mating in clear, cold, primarily sand-gravel and rock bottomed streams and foraging in riparian zones, fields and upland forests during the late spring and summer. They hibernate in the banks of the river in submerged tree roots between November 1 and March 31. Their summer habitat focuses within 90m (300ft of rivers) and they regularly travel 300m (0.2 mile) from rivers during this time. During summer they seek out early successional habitat: pastures, old fields, woodlands, powerline cuts and railroad beds bordering or adjacent to streams and rivers. Their habitat in Connecticut is already severely threatened by fragmentation of riverine, instream, riparian, and upland habitats, but is exacerbated by heavy adult mortality from machinery, cars, and collection. This is compounded by the species late maturity, low reproductive potential, and high nest and hatchling depredation rates.

- Consult this Technical Assistance Booklet for more information on how to best manage the property to benefit wood turtle:
  http://www.northeastturtles.org/uploads/3/0/4/3/30433006/glin_booklet_9618.pdf

Other GCN resources:
This area is included in a Core Block in the HUC6 Terrestrial Core-Connector Network (McGarigal et al 2017). These areas were designated as part of the Nature's Network project. You can access the report and spatial data for Nature's Network here:
https://nalcc.databasin.org/maps/522735111d19494a83b0a3badc710319
http://www.naturesnetwork.org/

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations

of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions (shannon.kearney@ct.gov). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney
Wildlife Biologist

United States Department of Agriculture

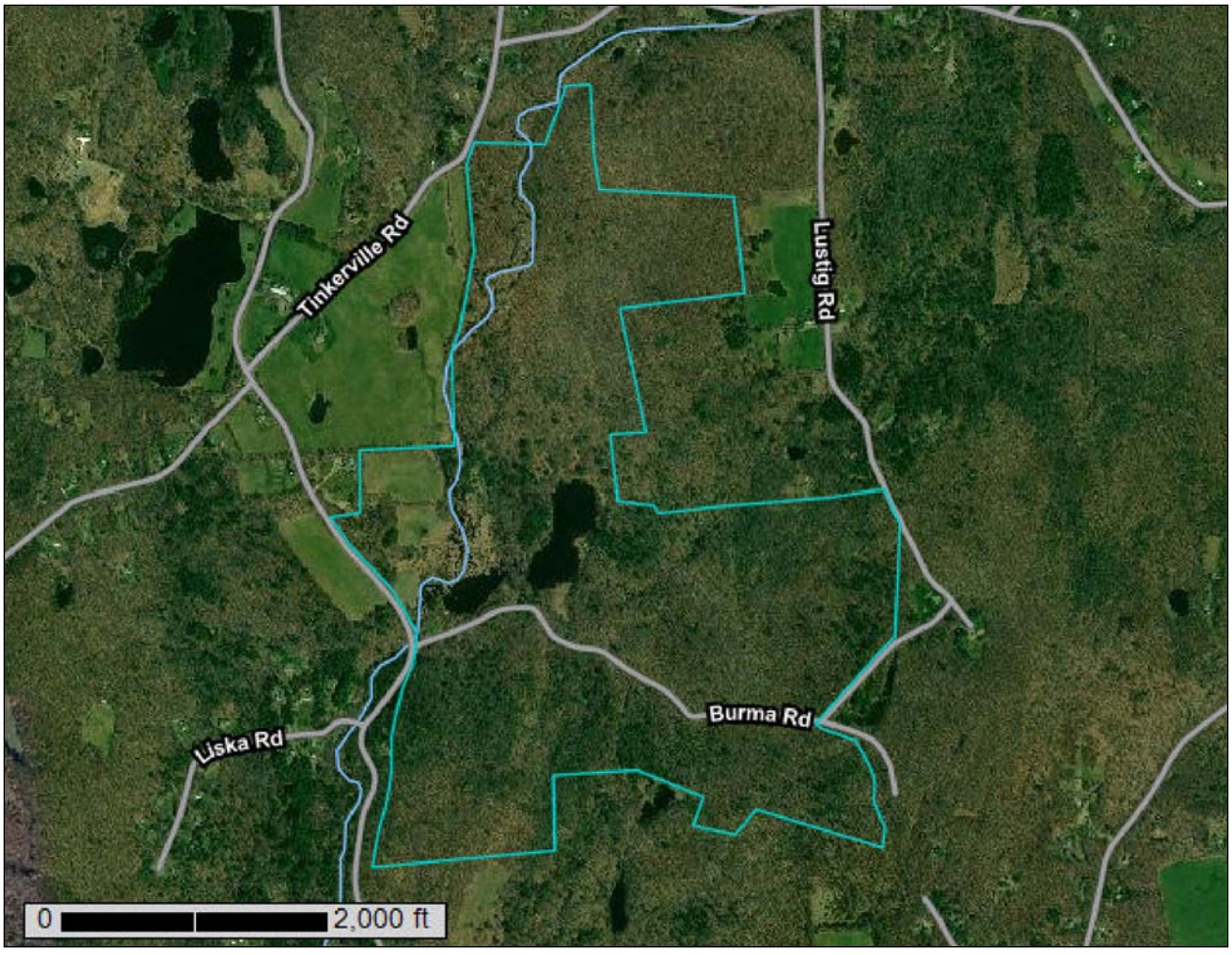
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

Fenton-Ruby Park and Drobney Sanctuary



September 7, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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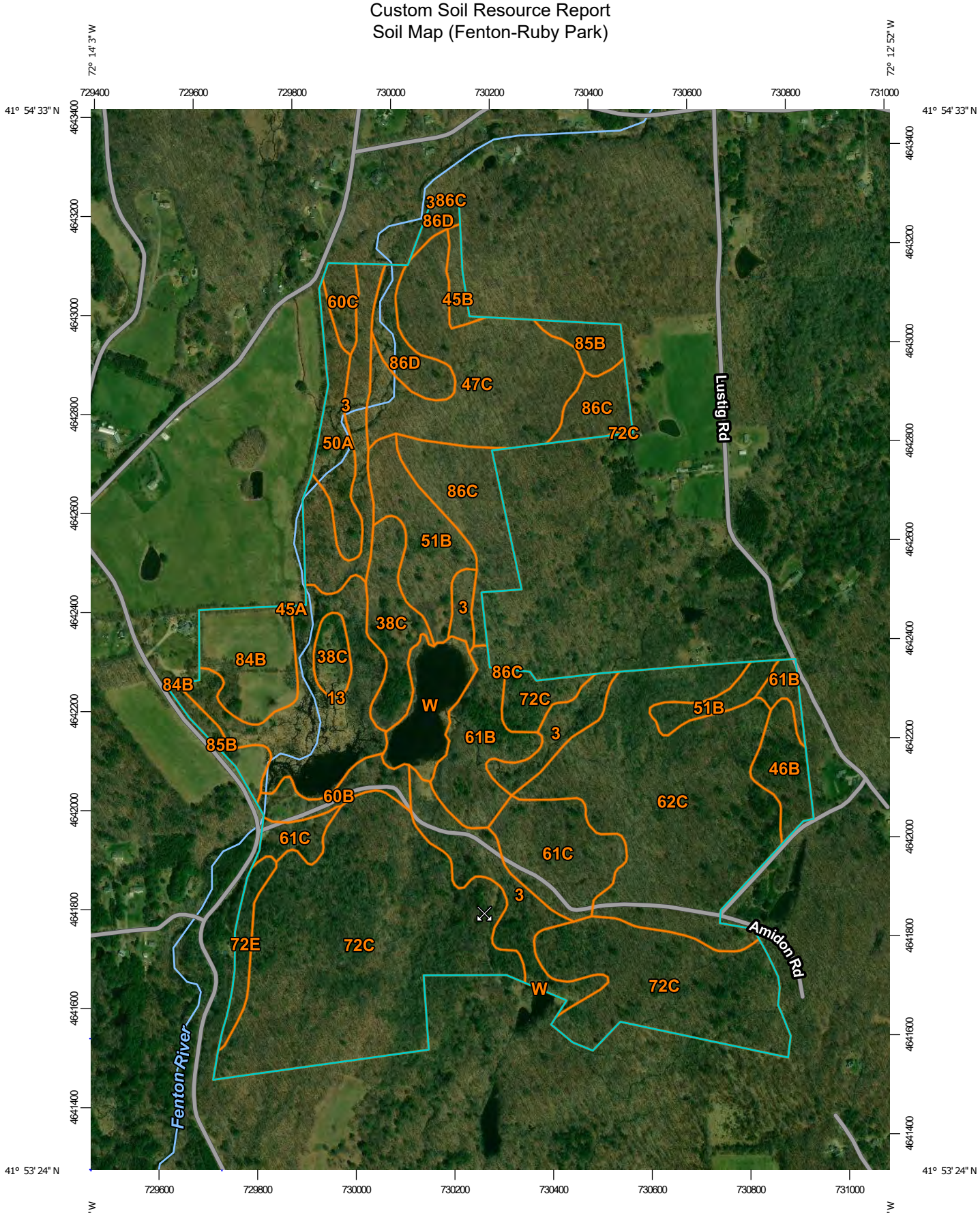
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Fenton-Ruby Park)



Map Scale: 1:10,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 30, 2013—Sep 23, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Fenton-Ruby Park)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	25.3	8.3%
13	Walpole sandy loam, 0 to 3 percent slopes	18.2	6.0%
38C	Hinckley loamy sand, 3 to 15 percent slopes	10.2	3.3%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	1.6	0.5%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	5.0	1.6%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	24.9	8.2%
50A	Sutton fine sandy loam, 0 to 3 percent slopes	6.5	2.1%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	12.8	4.2%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	4.5	1.5%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	2.3	0.8%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	11.4	3.7%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	13.7	4.5%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	43.8	14.4%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	78.5	25.8%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	3.0	1.0%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	9.5	3.1%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	5.4	1.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	14.4	4.7%
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	5.8	1.9%
W	Water	7.4	2.4%
Totals for Area of Interest		**304.1**	**100.0%**

Soil Information for Forestland

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Vegetative Productivity

This folder contains a collection of tabular reports that present vegetative productivity data. The reports (tables) include all selected map units and components for each map unit. Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

Forestland Productivity (Fenton-Ruby Park)

This table can help forestland owners or managers plan the use of soils for wood crops. It shows the potential productivity of the soils for wood crops.

Potential productivity of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forestland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service, National Forestry Manual.

Report—Forestland Productivity (Fenton-Ruby Park)

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	**Potential productivity**			**Trees to manage**
	Common trees	**Site Index**	**Volume of wood fiber**	
			Cu ft/ac/yr	
3—Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony				
Ridgebury, extremely stony	Eastern white pine	63	114.00	American elm, Blackgum, Green ash, Pin oak, Red maple, Swamp white oak, Yellow birch
	Northern red oak	66	43.00	
	Red maple	62	—	
	Sugar maple	56	29.00	
	White ash	60	—	
Leicester, extremely stony	Eastern white pine	69	129.00	Green ash, Red maple, Tuliptree
	Northern red oak	56	43.00	
	Red maple	70	43.00	
	Yellow birch	—	—	
Whitman, extremely stony	Blackgum	52	—	—
	Eastern white pine	56	100.00	
	Northern red oak	70	—	
	Red maple	60	29.00	
	Red spruce	44	86.00	
	White oak	57	—	
13—Walpole sandy loam, 0 to 3 percent slopes				
Walpole	Eastern hemlock	54	114.00	—
	Eastern white pine	68	114.00	
	Red maple	75	43.00	
	White ash	61	43.00	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac/yr	
38C—Hinckley loamy sand, 3 to 15 percent slopes				
Hinckley	Eastern white pine	61	100.00	Black oak, Eastern white pine, Pitch pine
	Northern red oak	49	29.00	
	Paper birch	60	54.00	
	Pitch pine	60	—	
	Red pine	54	92.00	
	Red spruce	39	86.00	
	Sugar maple	59	30.00	
	White spruce	52	114.00	
45A—Woodbridge fine sandy loam, 0 to 3 percent slopes				
Woodbridge	Black oak	77	—	Ash, Northern red oak, Sugar maple, Tuliptree, White oak
	Eastern white pine	67	114.00	
	Northern red oak	72	57.00	
	Red pine	65	114.00	
	Red spruce	50	114.00	
	Sugar maple	65	43.00	
	White oak	—	—	
	Yellow poplar	84	—	
45B—Woodbridge fine sandy loam, 3 to 8 percent slopes				
Woodbridge, fine sandy loam	Black oak	77	—	Ash, Northern red oak, Sugar maple, Tuliptree, White oak
	Eastern white pine	76	114.00	
	Northern red oak	72	57.00	
	Red pine	65	114.00	
	Red spruce	50	114.00	
	Sugar maple	65	43.00	
	Yellow poplar	84	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac/yr	
46B—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony				
Woodbridge, very stony	Black oak	77	—	Ash, Northern red oak, Sugar maple, Tuliptree, White oak
	Eastern white pine	67	114.00	
	Northern red oak	72	57.00	
	Red pine	65	114.00	
	Red spruce	50	114.00	
	Sugar maple	65	43.00	
	Yellow poplar	84	—	
47C—Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony				
Woodbridge, extremely stony	Black oak	77	—	Ash, Northern red oak, Sugar maple, Tuliptree, White oak
	Eastern white pine	67	114.00	
	Northern red oak	72	57.00	
	Red pine	65	114.00	
	Red spruce	50	114.00	
	Sugar maple	65	43.00	
	White oak	—	—	
	Yellow poplar	84	—	
50A—Sutton fine sandy loam, 0 to 3 percent slopes				
Sutton	Black cherry	72	43.00	Eastern white pine, European larch, Northern red oak, Norway spruce, White oak, White spruce
	Eastern white pine	62	114.00	
	Northern red oak	62	43.00	
	Red spruce	50	114.00	
	Sugar maple	54	29.00	
	White oak	—	—	
51B—Sutton fine sandy loam, 0 to 8 percent slopes, very stony				
Sutton, very stony	Black cherry	72	43.00	Eastern white pine, European larch, Northern red oak, Norway spruce, White oak, White spruce
	Eastern white pine	62	114.00	
	Northern red oak	62	43.00	
	Red spruce	50	114.00	
	Sugar maple	54	29.00	
	White oak	—	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	**Potential productivity**			**Trees to manage**
	Common trees	**Site Index**	**Volume of wood fiber**	
			Cu ft/ac/yr	
60B—Canton and Charlton fine sandy loams, 3 to 8 percent slopes				
Canton	Eastern hemlock	—	—	Beech, Bitternut hickory, Black oak, Eastern hemlock, Eastern white pine, Gray birch, Mockernut hickory, Northern red oak, Pignut hickory, Red maple, Shagbark hickory, Sugar maple, White ash, White oak, Yellow birch
	Eastern white pine	58	100.00	
	Northern red oak	52	29.00	
	White oak	—	—	
Charlton	Eastern hemlock	—	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Red maple	55	29.00	
	Red pine	70	129.00	
	Red spruce	50	114.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
60C—Canton and Charlton fine sandy loams, 8 to 15 percent slopes				
Canton	Eastern hemlock	—	—	Beech, Bitternut hickory, Black oak, Eastern hemlock, Eastern white pine, Gray birch, Mockernut hickory, Northern red oak, Pignut hickory, Red maple, Shagbark hickory, Sugar maple, White ash, White oak, Yellow birch
	Eastern white pine	58	100.00	
	Northern red oak	52	29.00	
	White oak	—	—	
Charlton	Eastern hemlock	—	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Red maple	55	29.00	
	Red pine	70	129.00	
	Red spruce	50	114.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	**Potential productivity**			**Trees to manage**
	Common trees	**Site Index**	**Volume of wood fiber**	
			Cu ft/ac/yr	
61B—Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony				
Canton, very stony	Eastern hemlock	—	—	Beech, Bitternut hickory, Black oak, Eastern hemlock, Eastern white pine, Gray birch, Mockernut hickory, Northern red oak, Pignut hickory, Red maple, Shagbark hickory, Sugar maple, White ash, White oak, Yellow birch
	Eastern white pine	58	100.00	
	Northern red oak	52	29.00	
	Red maple	55	29.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
Charlton, very stony	Eastern hemlock	—	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Red maple	55	29.00	
	Red pine	70	129.00	
	Red spruce	50	114.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
61C—Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony				
Canton, very stony	Eastern hemlock	—	—	Beech, Bitternut hickory, Black oak, Eastern hemlock, Eastern white pine, Gray birch, Mockernut hickory, Northern red oak, Pignut hickory, Red maple, Shagbark hickory, Sugar maple, White ash, White oak, Yellow birch
	Eastern white pine	58	100.00	
	Northern red oak	52	29.00	
	Red maple	55	29.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
Charlton, very stony	Eastern hemlock	—	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Red maple	55	29.00	
	Red pine	70	129.00	
	Red spruce	50	114.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	**Potential productivity**			**Trees to manage**
	Common trees	**Site Index**	**Volume of wood fiber**	
			Cu ft/ac/yr	
62C—Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony				
Canton, extremely stony	Eastern hemlock	—	—	Beech, Bitternut hickory, Black oak, Eastern hemlock, Eastern white pine, Gray birch, Mockernut hickory, Northern red oak, Pignut hickory, Red maple, Shagbark hickory, Sugar maple, White ash, White oak, Yellow birch
	Eastern white pine	58	100.00	
	Northern red oak	52	29.00	
	Red maple	55	29.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
Charlton, extremely stony	Eastern hemlock	—	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Red maple	55	29.00	
	Red pine	70	129.00	
	Red spruce	50	114.00	
	Shagbark hickory	—	0.00	
	Sugar maple	55	29.00	
	White oak	—	—	
72C—Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky				
Nipmuck	Eastern hemlock	—	—	Eastern hemlock, Eastern white pine, Northern red oak, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Sugar maple	55	29.00	
	White oak	—	—	
Brookfield	Eastern hemlock	—	—	Eastern white pine, Northern red oak, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Sugar maple	55	29.00	
	White oak	—	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac/yr	
72E—Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky				
Nipmuck	Eastern hemlock	—	—	Eastern hemlock, Eastern white pine, Northern red oak, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Sugar maple	55	29.00	
	White oak	—	—	
Brookfield	Eastern hemlock	—	—	Eastern white pine, Northern red oak, White oak
	Eastern white pine	65	114.00	
	Northern red oak	65	43.00	
	Sugar maple	55	29.00	
	White oak	—	—	
84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes				
Paxton	Black oak	67	—	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Eastern white pine	72	114.00	
	European larch	80	—	
	Northern red oak	68	43.00	
	Red pine	70	—	
	Scarlet oak	67	—	
	Sugar maple	75	43.00	
	White ash	89	—	
	White oak	60	—	
Montauk	Eastern white pine	75	143.00	Ash, Northern red oak, Sugar maple, Tuliptree, White oak
	Northern red oak	70	57.00	
	Sugar maple	65	43.00	
	White oak	—	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	**Potential productivity**			**Trees to manage**
	Common trees	**Site Index**	**Volume of wood fiber**	
			Cu ft/ac/yr	
85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony				
Paxton, very stony	American beech	65	40.00	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Black oak	67	—	
	Eastern white pine	66	114.00	
	European larch	80	—	
	Northern red oak	65	43.00	
	Red maple	65	40.00	
	Red pine	67	114.10	
	Red spruce	55	123.00	
	Scarlet oak	67	—	
	Sugar maple	74	43.00	
	White ash	85	47.00	
	White oak	60	—	
	Yellow birch	65	40.00	
Montauk, very stony	Black oak	67	—	Eastern hemlock, Eastern white pine, Elm, Gray birch, Northern red oak, Red maple, Scarlet oak, Sugar maple, Sweet birch, White ash, White oak, Yellow birch, Yellow poplar
	Eastern white pine	72	114.00	
	European larch	80	—	
	Northern red oak	68	43.00	
	Red pine	70	—	
	Scarlet oak	67	—	
	Sugar maple	75	43.00	
	White ash	89	—	
	White oak	60	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac/yr	
86C—Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony				
Paxton, extremely stony	American beech	65	40.00	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Black oak	67	—	
	Eastern white pine	66	114.00	
	European larch	80	—	
	Northern red oak	65	43.00	
	Red maple	65	40.00	
	Red pine	67	114.10	
	Red spruce	55	123.00	
	Scarlet oak	67	—	
	Sugar maple	74	43.00	
	White ash	86	47.00	
	White oak	60	—	
	Yellow birch	65	40.00	
Montauk, extremely stony	Black oak	67	—	Eastern hemlock, Eastern white pine, Elm, Gray birch, Northern red oak, Red maple, Scarlet oak, Sugar maple, Sweet birch, White ash, White oak, Yellow birch, Yellow poplar
	Eastern white pine	72	114.00	
	European larch	80	—	
	Northern red oak	68	43.00	
	Red pine	70	—	
	Scarlet oak	67	—	
	Sugar maple	75	43.00	
	White ash	89	—	
	White oak	60	—	

Forestland Productivity–State of Connecticut				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac/yr	
86D—Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony				
Paxton, extremely stony	American beech	65	40.00	Eastern white pine, European larch, Northern red oak, Norway spruce, Red pine, Scarlet oak, Sugar maple, Tuliptree, White ash, White oak
	Black oak	67	—	
	Eastern white pine	66	114.00	
	European larch	80	—	
	Northern red oak	65	43.00	
	Red maple	65	40.00	
	Red pine	67	114.10	
	Red spruce	55	123.00	
	Scarlet oak	67	—	
	Sugar maple	74	43.00	
	White ash	86	47.00	
	White oak	60	—	
	Yellow birch	65	40.00	
Montauk, extremely stony	Black oak	67	—	Eastern hemlock, Eastern white pine, Elm, Gray birch, Northern red oak, Red maple, Scarlet oak, Sugar maple, Sweet birch, White ash, White oak, Yellow birch, Yellow poplar
	Eastern white pine	72	114.00	
	European larch	80	—	
	Northern red oak	68	43.00	
	Red pine	70	—	
	Scarlet oak	67	—	
	Sugar maple	75	43.00	
	White ash	89	—	
	White oak	60	—	
W—Water				
Water	—	—	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition (Fenton-Ruby Park)

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

This table shows, for each soil that supports vegetation, the ecological site, plant association, or habitat type; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in the table follows.

An *ecological site, plant association, or habitat type* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site, plant association, or habitat type is typified by an association of species that differs from that of other ecological sites, plant associations, or habitat types in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service (NRCS). Descriptions of plant associations or habitat types are available from local U.S. Forest Service offices.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation (the grasses, forbs, shrubs, and understory trees that make up most of the potential natural plant community on each soil) is listed by common name. Under *rangeland composition and forest understory*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The percentages are by dry weight for rangeland. Percentages for forest understory are by either dry weight or canopy cover. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in the "National Range and Pasture Handbook," which is available in local offices of NRCS or on the Internet.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum

production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service, National range and pasture handbook.

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
3—Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Ridgebury, extremely stony	Wet Till Depressions (F144AY009CT)	—	—	—	American elm			
					blackgum			
					Canadian serviceberry			
					cinnamon fern			
					green ash			
					highbush blueberry			
					jewelweed			
					Moss			
					pin oak			
					red maple			
					rush			
					sedge			
					sensitive fern			
					skunk cabbage			
					southern arrowwood			
					speckled alder			
					spicebush			
					swamp white oak			
					sweet pepperbush			
					Winterberry			
					yellow birch			
Leicester, extremely stony	Wet Till Depressions (F144AY009CT)	—	—	—	American false hellebore			
					Canadian serviceberry			
					cinnamon fern			
					coastal sweetpepperbush			
					common ladyfern			
					false Solomons seal			
					highbush blueberry			
					northern spicebush			
					skunk cabbage			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Whitman, extremely stony	Wet Till Depressions (F144AY009CT)	—	—	—	alder			
					American elm			
					American false hellebore			
					cinnamon fern			
					eastern hemlock			
					gray birch			
					jewelweed			
					northern spicebush			
					red maple			
					rush			
					sedge			
					sensitive fern			
					silky dogwood			
					skunk cabbage			
					sphagnum moss			
13—Walpole sandy loam, 0 to 3 percent slopes								
Walpole	Wet Outwash (F144AY028MA)	—	—	—	ash			
					eastern white pine			
					elm			
					hemlock			
					red maple			
					swamp white oak			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
38C—Hinckley loamy sand, 3 to 15 percent slopes								
Hinckley	Dry Outwash (F144AY022MA)	—	—	—	black oak			
					brackenfern			
					eastern hemlock			
					eastern white pine			
					little bluestem			
					lowbush blueberry			
					northern red oak			
					pitch pine			
					scarlet oak			
					sweet fern			
					white oak			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
45A—Woodbridge fine sandy loam, 0 to 3 percent slopes								
Woodbridge	Moist Dense Till Uplands (F144AY037MA)	—	—	—	American witchhazel			
					cinnamon fern			
					coastal sweetpepperbush			
					common ladyfern			
					false Solomons seal			
					highbush blueberry			
					Jack in the pulpit			
					Japanese barberry			
					nannyberry			
					northern spicebush			
					sensitive fern			
					swamp azalea			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
45B—Woodbridge fine sandy loam, 3 to 8 percent slopes								
Woodbridge, fine sandy loam	Moist Dense Till Uplands (F144AY037MA)	—	—	—	American witchhazel			
					cinnamon fern			
					coastal sweetpepperbush			
					common ladyfern			
					false Solomons seal			
					highbush blueberry			
					Jack in the pulpit			
					Japanese barberry			
					nannyberry			
					northern spicebush			
					sensitive fern			
					swamp azalea			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
46B—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony								
Woodbridge, very stony	Moist Dense Till Uplands (F144AY037MA)	—	—	—	American witchhazel			
					cinnamon fern			
					coastal sweetpepperbush			
					common ladyfern			
					false Solomons seal			
					highbush blueberry			
					Jack in the pulpit			
					Japanese barberry			
					nannyberry			
					northern spicebush			
					sensitive fern			
					swamp azalea			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
47C—Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony								
Woodbridge, extremely stony	Moist Dense Till Uplands (F144AY037MA)	—	—	—	American witchhazel			
					cinnamon fern			
					coastal sweetpepperbush			
					common ladyfern			
					false Solomons seal			
					highbush blueberry			
					Jack in the pulpit			
					Japanese barberry			
					nannyberry			
					northern spicebush			
					sensitive fern			
					swamp azalea			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
50A—Sutton fine sandy loam, 0 to 3 percent slopes								
Sutton	Moist Till Uplands (F144AY008CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					hickory			
					Jack in the pulpit			
					northern red oak			
					northern spicebush			
					red maple			
					white oak			
51B—Sutton fine sandy loam, 0 to 8 percent slopes, very stony								
Sutton, very stony	Moist Till Uplands (F144AY008CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					hickory			
					Jack in the pulpit			
					northern red oak			
					northern spicebush			
					red maple			
					white oak			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
60B—Canton and Charlton fine sandy loams, 3 to 8 percent slopes								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Canton	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hazelnut			
					beech			
					black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					red maple			
					snowberry			
					striped prince's pine			
					white ash			
					white oak			
					yellow birch			
Charlton	Well Drained Till Uplands (F144AY034CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					snowberry			
					sugar maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
60C—Canton and Charlton fine sandy loams, 8 to 15 percent slopes								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Canton	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hazelnut			
					beech			
					black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					red maple			
					snowberry			
					striped prince's pine			
					white ash			
					white oak			
					yellow birch			
Charlton	Well Drained Till Uplands (F144AY034CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					snowberry			
					sugar maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
61B—Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Canton, very stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hazelnut			
					beech			
					black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					red maple			
					snowberry			
					striped prince's pine			
					white ash			
					white oak			
					yellow birch			
Charlton, very stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					snowberry			
					sugar maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
61C—Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Canton, very stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hazelnut			
					beech			
					black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					red maple			
					snowberry			
					striped prince's pine			
					white ash			
					white oak			
					yellow birch			
Charlton, very stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					snowberry			
					sugar maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
62C—Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Canton, extremely stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hazelnut			
					beech			
					black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					red maple			
					snowberry			
					striped prince's pine			
					white ash			
					white oak			
					yellow birch			
Charlton, extremely stony	Well Drained Till Uplands (F144AY034CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					snowberry			
					sugar maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
72C—Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Nipmuck	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hornbeam			
					beaked hazelnut			
					black oak			
					eastern hemlock			
					eastern white pine			
					groundcedar			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					pignut hickory			
					prince's pine			
					red maple			
					shagbark hickory			
					sugar maple			
					sweet birch			
					white oak			
Brookfield	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hornbeam			
					beaked hazelnut			
					black oak			
					eastern hemlock			
					eastern white pine			
					groundcedar			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					pignut hickory			
					prince's pine			
					red maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
72E—Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Nipmuck	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hornbeam			
					beaked hazelnut			
					black oak			
					eastern hemlock			
					eastern white pine			
					groundcedar			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					pignut hickory			
					prince's pine			
					red maple			
					shagbark hickory			
					sugar maple			
					sweet birch			
					white oak			
Brookfield	Well Drained Till Uplands (F144AY034CT)	—	—	—	American hornbeam			
					beaked hazelnut			
					black oak			
					eastern hemlock			
					eastern white pine			
					groundcedar			
					lowbush blueberry			
					mapleleaf viburnum			
					mountain laurel			
					northern red oak			
					pignut hickory			
					prince's pine			
					red maple			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes								
Paxton	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			
					sugar maple			
					sweet birch			
					white oak			
Montauk	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	—			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Paxton, very stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			
					sugar maple			
					sweet birch			
					white oak			
Montauk, very stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
86C—Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Paxton, extremely stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			
					sugar maple			
					sweet birch			
					white oak			
Montauk, extremely stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**			**Rangeland**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
86D—Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony								

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
Paxton, extremely stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			
					sugar maple			
					sweet birch			
					white oak			
Montauk, extremely stony	Well Drained Dense Till Uplands (F144AY007CT)	—	—	—	black oak			
					eastern hemlock			
					eastern white pine			
					gray birch			
					groundcedar			
					hickory			
					Japanese barberry			
					lowbush blueberry			
					mapleleaf viburnum			
					northern red oak			
					red maple			
					sensitive fern			
					snowberry			

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition–State of Connecticut								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year			Rangeland	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	
W—Water								
Water	—	—	—	—	—			

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STOCKING CHART						vol/acre		2033				
Owner:	**Fenton-Ruby**		Stand:	**ST 1**		Basal Area per acre		**60**	**Square Ft**			
Located:	**0.00**		Stand Ac:	**5**	**acres**	Trees per acre		**105**				
Town:	**0.00**		Parcel:	**5**	**acres**	Mean Stand Diameter		**10.23**	**Inches**			
Date:			Plots:	**2**		UGS BA per acre		**15**	**Square Ft**			
						%UGS		**25%**				
Number per acre												
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total	
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.45	0.00	25.45	
8	0.00	0.00	0.00	0.00	14.30	0.00	0.00	0.00	0.00	0.00	14.30	
10	0.00	18.30	0.00	0.00	9.15	0.00	0.00	9.15	0.00	0.00	36.60	
12	0.00	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.35	12.70	
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.40	9.40	
16	0.00	3.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60	
18	0.00	0.00	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.85	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
28 (+)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	28.25	2.85	0.00	23.45	0.00	0.00	9.15	25.45	15.75	104.90	
Total BA	0.00	20.00	5.00	0.00	10.00	0.00	0.00	5.00	5.00	15.00	60.00	
% by Spp.	0.00	33.33	8.33	0.00	16.67	0.00	0.00	8.33	8.33	25.00	100.00	
		SF	%									
Poletimber (6"-12")		30.00	50.00									
Sm. Sawtimber (12"-16")		20.00	33.33									
Med. Sawtimber (16"-20")		10.00	16.67									
Lg. Sawtimber (20"+)		0.00	0.00									
VOLUME TABLE		**Fenton-Rub**	**0**	**Stand:**	**ST 1**							
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total	
12	0	197	0	0	0	0	0	0	0	197	394	
14	0	0	0	0	0	0	0	0	0	733	733	
16	0	382	0	0	0	0	0	0	0	0	382	
18	0	0	524	0	0	0	0	0	0	0	524	
20	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	
26	0	0	0	0	0	0	0	0	0	0	0	
28 (+)	0	0	0	0	0	0	0	0	0	0	0	
Total	0	578	524	0	0	0	0	0	0	930	2,033	
Total Vol	0	2,892	2,622	0	0	0	0	0	0	4,650	10,165	
Total Value	$0	$658	$598	$0	$0	$0	$0	$0	$0	$163	$1,419	
												val/acre
Value/MBF	$0	$228	$228	$150	$100	$55	$40	$30	$25	$35		283.71

STOCKING CHART						vol/acre		4771			
Owner:	**Fenton-Ruby**		Stand:	**ST 4**		Basal Area per acre		**50**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**1**	**acres**	Trees per acre		**21**			
Town:	**0.00**		Parcel:	**1**	**acres**	Mean Stand Diameter		**20.92**	**Inches**		
Date:			Plots:	**2**		UGS BA per acre		**5**	**Square Ft**		
						%UGS		**10%**			
Number per acre											
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.85
20	0.00	4.60	0.00	0.00	6.90	0.00	0.00	0.00	0.00	0.00	11.50
22	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.80
24	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 (+)	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15
Total	0.00	14.00	0.00	0.00	6.90	0.00	0.00	0.00	0.00	0.00	20.90
Total BA	0.00	35.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	50.00
% by Spp.	0.00	70.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	100.00

	SF	%
Poletimber (6"-12")	0.00	0.00
Sm. Sawtimber (12"-16")	0.00	0.00
Med. Sawtimber (16"-20")	5.00	10.00
Lg. Sawtimber (20"+)	45.00	90.00

VOLUME TABLE	**Fenton-Ruby**			**Stand:**	**ST 4**						
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total
12	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0
18	0	388	0	0	0	0	0	0	0	0	388
20	0	787	0	0	1994	0	0	0	0	0	2781
22	0	802	0	0	0	0	0	0	0	0	802
24	0	402	0	0	0	0	0	0	0	0	402
26	0	0	0	0	0	0	0	0	0	0	0
28 (+)	0	399	0	0	0	0	0	0	0	0	399
Total	0	2,777	0	0	1,994	0	0	0	0	0	4,771
Total Vol	0	2,777	0	0	1,994	0	0	0	0	0	4,771

STOCKING CHART						vol/acre		1758			
Owner:	**Fenton-Ruby**		Stand:	**ST 5**		Basal Area per acre		**90**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**7**	**acres**	Trees per acre		**179**			
Town:	**0.00**		Parcel:	**7**	**acres**	Mean Stand Diameter		**9.59**	**Inches**		
Date:			Plots:	**2**		UGS BA per acre		**15**	**Square Ft**		
						%UGS		**17%**			
Number per acre											
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total
6	0.00	25.45	0.00	0.00	25.45	0.00	0.00	0.00	0.00	0.00	50.90
8	0.00	0.00	0.00	0.00	0.00	0.00	28.60	0.00	0.00	0.00	28.60
10	0.00	0.00	0.00	0.00	9.15	0.00	45.75	0.00	0.00	0.00	54.90
12	0.00	0.00	0.00	0.00	6.35	0.00	25.40	0.00	0.00	0.00	31.75
14	0.00	0.00	0.00	0.00	0.00	0.00	9.40	0.00	0.00	0.00	9.40
16	0.00	0.00	0.00	0.00	0.00	0.00	3.60	0.00	0.00	0.00	3.60
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 (+)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	25.45	0.00	0.00	40.95	0.00	112.75	0.00	0.00	0.00	179.15
Total BA	0.00	5.00	0.00	0.00	15.00	0.00	70.00	0.00	0.00	0.00	90.00
% by Spp.	0.00	5.56	0.00	0.00	16.67	0.00	77.78	0.00	0.00	0.00	100.00
		SF	%								
Poletimber (6"-12")		50.00	55.56								
Sm. Sawtimber (12"-16")		35.00	38.89								
Med. Sawtimber (16"-20")		5.00	5.56								
Lg. Sawtimber (20"+)		0.00	0.00								
VOLUME TABLE		**Fenton-Ruby**		**Stand:**	**ST 5**						
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Aspen	Sugar	Ash	Total
12	0	0	0	0	197	0	787	0	0	0	984
14	0	0	0	0	0	0	569	0	0	0	569
16	0	0	0	0	0	0	205	0	0	0	205
18	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0
28 (+)	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	197	0	1,561	0	0	0	1,758
Total Vol	0	0	0	0	1,378	0	10,929	0	0	0	12,307

STOCKING CHART

Owner:	**Fenton-Ruby**		Stand:	**ST 6**		Basal Area per acre		**68**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**15.5**	**acres**	Trees per acre		**111**			
Town:	**0.00**		Parcel:	**15.5**	**acres**	Mean Stand Diameter		**10.60**	**Inches**		
Date:			Plots:	**5**		UGS BA per acre		**34**	**Square Ft**		
						%UGS		**50%**			

Number per acre

DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Hickory	Sugar	Ash	Total
6	0.00	0.00	0.00	0.00	0.00	30.54	10.18	0.00	0.00	0.00	40.72
8	0.00	0.00	0.00	0.00	11.44	0.00	5.72	0.00	0.00	0.00	17.16
10	0.00	0.00	0.00	0.00	7.32	0.00	10.98	0.00	0.00	0.00	18.30
12	0.00	0.00	0.00	0.00	0.00	5.08	0.00	0.00	0.00	0.00	5.08
14	0.00	0.00	1.88	1.88	5.64	0.00	0.00	3.76	3.76	0.00	16.92
16	0.00	0.00	0.00	1.44	0.00	0.00	0.00	2.88	1.44	0.00	5.76
18	0.00	1.14	0.00	0.00	0.00	0.00	1.14	2.28	0.00	0.00	4.56
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00	0.00	0.00	1.52
24	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.64
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 (+)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	1.14	1.88	4.84	25.04	35.62	28.02	8.92	5.20	0.00	110.66
Total BA	0.00	2.00	2.00	8.00	16.00	10.00	12.00	12.00	6.00	0.00	68.00
% by Spp.	0.00	2.94	2.94	11.76	23.53	14.71	17.65	17.65	8.82	0.00	100.00

	SF	%
Poletimber (6"-12")	24.00	35.29
Sm. Sawtimber (12"-16")	22.00	32.35
Med. Sawtimber (16"-20")	16.00	23.53
Lg. Sawtimber (20"+)	6.00	8.82

VOLUME TABLE **Fenton-Ruby** **Stand:** **ST 6**

DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Black Birch	Red Maple	Hickory	Sugar	Ash	Total
12	0	0	0	0	0	157	0	0	0	0	157
14	0	0	81	147	243	0	0	278	162	0	910
16	0	0	0	82	0	0	0	412	82	0	576
18	0	210	0	0	0	0	83	310	0	0	603
20	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	169	0	0	0	0	0	0	169
24	0	0	0	0	335	0	0	0	0	0	335
26	0	0	0	0	0	0	0	0	0	0	0
28 (+)	0	0	0	0	0	0	0	0	0	0	0
Total	0	210	81	397	577	157	83	1,000	244	0	2,750
Total Vol	0	3,251	1,253	6,160	8,947	2,441	1,290	15,502	3,778	0	42,623

STOCKING CHART						vol/acre		7876			
Owner:	**Fenton-Ruby**		Stand:	**ST 7**		Basal Area per acre		**89**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**74**	**acres**	Trees per acre		**75**			
Town:	**0.00**		Parcel:	**74**	**acres**	Mean Stand Diameter		**14.70**	**Inches**		
Date:			Plots:	**19**		UGS BA per acre		**11**	**Square Ft**		
						%UGS		**12%**			
Number per acre											
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Ash	Total
6	0.00	0.00	0.00	0.00	0.00	0.00	2.68	0.00	0.00	0.00	2.68
8	0.00	0.00	0.00	1.51	6.02	0.00	4.52	6.02	0.00	0.00	18.06
10	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00	1.93
12	0.00	0.00	1.34	1.34	0.67	0.00	1.34	4.68	1.34	0.00	10.69
14	0.00	0.00	0.49	3.46	0.00	0.49	2.47	1.98	1.98	0.49	11.38
16	0.00	0.76	0.76	4.55	0.76	1.14	0.76	3.03	1.14	0.76	13.64
18	0.00	0.30	0.00	2.10	0.30	0.00	0.30	0.90	0.30	0.00	4.20
20	0.00	0.73	0.48	0.73	0.24	1.45	0.00	0.48	0.00	0.00	4.12
22	0.00	1.20	1.20	1.40	0.60	0.40	0.00	0.00	0.00	0.00	4.80
24	0.00	0.51	1.01	0.67	0.34	0.17	0.00	0.00	0.00	0.00	2.69
26	0.00	0.14	0.43	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.85
28 (+)	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.24
Total	0.00	3.63	5.71	15.89	9.31	3.65	13.99	17.09	4.75	1.25	75.29
Total BA	0.00	8.42	11.58	23.16	8.95	6.84	8.42	14.74	5.26	1.58	88.95
% by Spp.	0.00	9.47	13.02	26.04	10.06	7.69	9.47	16.57	5.92	1.78	100.00

	SF	%
Poletimber (6"-12")	7.89	8.88
Sm. Sawtimber (12"-16")	20.53	23.08
Med. Sawtimber (16"-20")	26.32	29.59
Lg. Sawtimber (20"+)	34.21	38.46

VOLUME TABLE **Fenton-Ruby** **Stand:** **ST 7**

DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Ash	Total
12	0	0	75	41	49	0	58	229	75	0	527
14	0	0	39	249	0	39	193	208	146	39	912
16	0	94	94	538	94	144	94	419	102	94	1675
18	0	70	0	344	94	0	55	180	41	0	784
20	0	185	98	124	41	395	0	141	0	0	985
22	0	392	348	387	260	147	0	0	0	0	1535
24	0	175	346	169	162	58	0	0	0	0	910
26	0	59	172	22	89	0	0	0	0	0	342
28 (+)	0	0	0	0	206	0	0	0	0	0	206
Total	0	975	1,172	1,875	997	783	401	1,177	364	133	7,876
Total Vol	0	72,156	86,699	138,743	73,773	57,955	29,649	87,105	26,939	9,838	582,856

STOCKING CHART						vol/acre		6424			
Owner:	**Fenton-Ruby**		Stand:	**ST 8**		Basal Area per acre		**88**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**33**	**acres**	Trees per acre		**115**			
Town:	**0.00**		Parcel:	**33**	**acres**	Mean Stand Diameter		**11.81**	**Inches**		
Date:			Plots:	**9**		UGS BA per acre		**10**	**Square Ft**		
						%UGS		**11%**			
Number per acre											
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Beech	Total
6	0.00	0.00	0.00	0.00	16.97	0.00	11.31	0.00	0.00	0.00	28.28
8	0.00	0.00	0.00	3.18	15.89	0.00	0.00	12.71	9.53	3.18	44.49
10	0.00	0.00	0.00	0.00	2.03	0.00	0.00	2.03	0.00	0.00	4.07
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.64	0.00	0.00	5.64
14	0.00	2.09	1.04	0.00	0.00	0.00	0.00	5.22	0.00	0.00	8.36
16	0.00	0.00	0.80	2.40	0.80	1.60	2.40	4.00	0.00	0.00	12.00
18	0.00	0.00	1.27	0.00	0.00	0.00	0.00	1.27	0.00	0.00	2.53
20	0.00	0.00	0.00	0.00	0.00	0.51	0.51	0.00	0.00	0.00	1.02
22	0.00	0.84	1.69	0.84	0.00	0.42	0.00	0.00	0.00	0.00	3.80
24	0.00	0.36	1.78	0.36	0.00	0.00	0.00	0.00	0.00	0.00	2.49
26	0.00	0.60	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
28 (+)	0.00	0.26	0.51	0.00	0.51	0.00	0.00	0.00	0.00	0.00	1.28
Total	0.00	4.14	7.69	6.78	36.20	2.53	14.22	30.88	9.53	3.18	115.16
Total BA	0.00	8.89	18.89	7.78	13.33	4.44	6.67	23.33	3.33	1.11	87.78
% by Spp.	0.00	10.13	21.52	8.86	15.19	5.06	7.59	26.58	3.80	1.27	100.00

	SF	%
Poletimber (6"-12")	23.33	26.58
Sm. Sawtimber (12"-16")	13.33	15.19
Med. Sawtimber (16"-20")	21.11	24.05
Lg. Sawtimber (20"+)	30.00	34.18

VOLUME TABLE **Fenton-Ruby** **Stand:** **ST 8**

DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Beech	Total
12	0	0	0	0	0	0	0	175	0	0	175
14	0	191	81	0	0	0	0	326	0	0	598
16	0	0	114	343	85	229	314	661	0	0	1746
18	0	0	233	0	0	0	0	233	0	0	466
20	0	0	0	0	0	120	87	0	0	0	207
22	0	278	490	311	0	89	0	0	0	0	1167
24	0	89	548	123	0	0	0	0	0	0	760
26	0	248	214	0	0	0	0	0	0	0	462
28 (+)	0	157	281	0	405	0	0	0	0	0	843
Total	0	964	1,961	777	489	437	401	1,395	0	0	6,424
Total Vol	0	31,813	64,705	25,640	16,148	14,437	13,233	46,025	0	0	212,002

STOCKING CHART						vol/acre		7930			
Owner:	**Fenton-Ruby**		Stand:	**ST 9**		Basal Area per acre		**94**	**Square Ft**		
Located:	**0.00**		Stand Ac:	**60**	**acres**	Trees per acre		**100**			
Town:	**0.00**		Parcel:	**60**	**acres**	Mean Stand Diameter		**13.09**	**Inches**		
Date:			Plots:	**11**		UGS BA per acre		**11**	**Square Ft**		
						%UGS		**12%**			
Number per acre											
DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Beech	Total
6	0.00	0.00	0.00	0.00	4.63	0.00	18.51	0.00	0.00	0.00	23.14
8	0.00	0.00	0.00	0.00	5.20	0.00	2.60	0.00	2.60	0.00	10.40
10	0.00	0.00	0.00	0.00	3.33	0.00	1.66	1.66	1.66	0.00	8.32
12	0.00	0.00	1.15	3.46	2.31	0.00	4.62	0.00	2.31	0.00	13.85
14	0.00	1.71	4.27	2.56	0.00	3.42	1.71	0.00	2.56	0.00	16.24
16	0.00	1.31	1.31	3.93	2.62	1.96	0.65	0.00	0.00	0.00	11.78
18	0.00	2.59	2.07	2.07	0.00	1.04	0.00	0.00	0.00	0.00	7.77
20	0.00	0.42	0.42	0.42	0.00	0.42	0.00	0.00	0.42	0.00	2.09
22	0.00	0.69	2.42	0.35	0.35	1.04	0.00	0.00	0.00	0.00	4.84
24	0.00	0.58	0.00	0.00	0.00	0.29	0.00	0.00	0.29	0.00	1.16
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28 (+)	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.42
Total	0.00	7.30	11.65	12.79	18.85	8.16	29.75	1.66	9.85	0.00	100.01
Total BA	0.00	12.73	18.18	16.36	12.73	12.73	11.82	0.91	8.18	0.00	93.64
% by Spp.	0.00	13.59	19.42	17.48	13.59	13.59	12.62	0.97	8.74	0.00	100.00

	SF	%
Poletimber (6"-12")	12.73	13.59
Sm. Sawtimber (12"-16")	28.18	30.10
Med. Sawtimber (16"-20")	30.00	32.04
Lg. Sawtimber (20"+)	22.73	24.27

VOLUME TABLE **Fenton-Ruby** **Stand:** **ST 9**

DBH	Snags	Red Oak	Black Oak	White Oak	White Pine	Scarlet	Red Maple	Hickory	Sugar	Beech	Total
12	0	0	65	194	100	0	172	0	100	0	632
14	0	179	402	170	0	382	133	0	223	0	1490
16	0	211	163	457	447	281	94	0	0	0	1653
18	0	477	382	324	0	166	0	0	0	0	1349
20	0	72	124	72	0	98	0	0	124	0	488
22	0	254	778	127	150	300	0	0	0	0	1609
24	0	201	0	0	0	101	0	0	101	0	403
26	0	0	0	0	0	0	0	0	0	0	0
28 (+)	0	0	0	0	307	0	0	0	0	0	307
Total	0	1,395	1,913	1,344	1,004	1,327	399	0	548	0	7,930
Total Vol	0	83,680	114,806	80,635	60,237	79,639	23,936	0	32,875	0	475,808