Forest Stewardship Plan

Town of Bloomfield

935 Acres in Bloomfield CT
2025-2035

Connwood Foresters, Inc.

EXECUTIVE SUMMARY

Connwood Foresters, Inc. prepared this comprehensive Forest Stewardship Plan (FSP) for approximately 935 acres of town-owned properties in Bloomfield, Connecticut. This plan is intended to guide the stewardship of 20 town-owned properties managed by the Town of Bloomfield Parks, Recreation, and Leisure Services for the period of 2025-2035. This plan provides detailed assessments of forest health, wildlife habitat, invasive species impacts, recreational potential, and boundary management. Connwood Foresters, Inc. conducted fieldwork during the winter and spring of 2025.

Bloomfield's municipal forests play a crucial role in the community by providing essential ecological services, including clean air and water, wildlife habitats, carbon sequestration, and recreational opportunities, all while enhancing regional resilience to climate change and environmental stressors. Given Bloomfield's urban and suburban context, these green spaces are also vital for mitigating stormwater impacts, reducing urban heat island affect, and improving the quality of life for residents.

This plan emphasizes sustainable stewardship practices designed to enhance forest ecosystem resilience, biodiversity, and the quality of wildlife habitats. Urban forestry elements, recreational enhancements, and community engagement opportunities are integral to the recommendations provided. Implementation of this plan will ensure the long-term ecological integrity, recreational accessibility, and educational potential of Bloomfield's community forests.

The stewardship objectives outlined in this plan aim to:

- Sustain and enhance the long-term health of forest ecosystems.
- Increase biodiversity by promoting native species and controlling invasive species.
- Improve wildlife habitat, particularly through managing invasive plant species and maintaining habitat complexity.
- Enhance recreational opportunities and community engagement through trail development, interpretive signage, and environmental education.
- Clearly define and manage boundaries to prevent encroachment, dumping, and unauthorized use.

Key recommendations include invasive species removal, establishing native plantings in park settings or canopy gap areas, enhancing trail infrastructure, and implementing educational outreach initiatives to foster community stewardship. Regular monitoring and adaptive management practices are proposed to ensure long-term success and responsiveness to emerging forest health issues, such as pest outbreaks and climatic events.

By implementing the actions outlined in this plan, the Town of Bloomfield will significantly enhance the ecological integrity, recreational value, and overall sustainability of its public forest resources for current and future generations.

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GENERAL INFORMATION

Dates Prepared:

Data Collected: January - April, 2025
Submitted to the Town of Bloomfield: June 2025

Prepared by:

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Property Owner:

Town of Bloomfield
Managed by Town of Bloomfield Parks, Recreation, & Leisure Services
800 Bloomfield Ave
Bloomfield, CT, 06002

Property Address:

See below

Latitude and Longitude:

See below

Acreage:

~935 acres across 20 properties

INTRODUCTION

Upon Request by the Town of Bloomfield, Connwood Foresters, Inc. has prepared a Forest Stewardship Plan for a ten-year period (2025–2035) for approximately 935 acres of woodland and park space owned and managed by the town in Bloomfield, CT. Surveys of the properties were conducted during the winter and spring of 2025 to determine how best to implement the natural resource stewardship objectives of the landowner.

The Town of Bloomfield is responsible for managing and overseeing more than 20 properties across Bloomfield, CT, for conservation and public use. The management plan is based on the environmental characteristics of the property and is used to determine appropriate conservation and use. This plan includes a property description, an analysis of the property's unique characteristics and acceptable uses. While the Town of Bloomfield is ultimately responsible for property management, implementing a management program will require the involvement of diverse stakeholders.

Stewardship Objectives

1. **Long term forest health including:**
    a. Engage in sustainable stewardship of the land
    b. Maintain and improve forest ecosystem health and resilience
    c. Maintain and improve forest woody plant biodiversity
    d. Enhance forest resilience to pests and pathogens
    e. Improve wildlife habitat diversity
    f. Improve Bloomfield's climate resiliency
2. **Safe and responsible recreation opportunities**
    a. Trail placement and maintenance
    b. Educational opportunities
    c. Identify and address maintenance concerns
    d. Encourage more use by local community members

Why should we protect and steward our forests?

Forests purify our water and air, supply food and shelter for wildlife, protect our soil, and provide peace and tranquility for people who visit them. Forestry is the science and art of managing forests for healthy, productive, and diverse tree communities. Using silvicultural prescriptions, we can create desired aesthetic features, manage forests for timber production, restore wildlife habitat, recreation, or all of the above.

This forest stewardship plan will provide detailed and applicable recommendations for the long-term protection and use of the forest resources. The plan will describe in detail the composition of the forest's age, size classes, species distribution, and data on avian species present or absent to gain perspective on how the forest functions as a wildlife habitat. The data from this plan will allow the landowner to realize the full potential of the forest, both ecologically and economically. The inventory data collected in the winter and spring of 2025 provides the basis for these recommendations. Implementing these recommendations can establish enduring forest improvements that will outlast our lifetime and benefit beyond the property's boundaries.

The recommendations within this plan are designed to cover a ten-year management period. As management progresses on this property, it may become apparent that some recommendations are no longer feasible or appropriate, and others will become critical. Please note that while these management activities are scheduled for

specific periods over the next ten years, they are merely recommendations based on our knowledge at the given moment. The recommendations do not have to be followed in the order listed or at all. Furthermore, they are just that: recommendations from professionals for the landowner to consider. Connwood Foresters Inc. is available to assist you with all the management recommendations outlined in this plan.

Please refer to the maps as you read the plan. Throughout the following narrative, the features described can be located on the maps. Using the maps will make the narrative much more meaningful. Please also refer to the Glossary section to explain any unfamiliar or confusing terms.

Picture 1: Wilcox Park

LAND USE HISTORY

The lands of what is present-day Connecticut have been occupied by humans, at least since the retreat of the Wisconsin glacier some 11,000 years ago. Agriculture in these areas dates back to the crop gardens of indigenous peoples who cultivated crops such as maize, beans, squash, sunflower, and Jerusalem artichokes.

European settlers brought their own land-use practices, which generally involved clearing large tracts of land for grazing livestock and cultivating crops. Subsistence farming persisted as the standard practice for most of the state's residents until the middle of the 19th century. The rise of the Industrial Revolution led to a complete change in the region's economic landscape, marking a departure from the traditional agrarian economy. The final push for life within the agrarian tradition was the boom and bust of the Merion sheep spanning from the early to mid-1800s. Initially, the marginal land was cleared for brush meadow pasture; however, these lands were abandoned due to market collapse and emigration to the West during the 1850s onwards. This abandonment led to the birth of the second-growth forests we see in Connecticut today.

Bloomfield's origins date back to the Poquonock Native Americans in a region that later became part of Windsor, the oldest English settlement in Connecticut – founded in 1633. In the early 1600s, severe smallpox epidemics devastated local Indigenous communities, weakening their populations and paving the way for English newcomers. As tensions between tribes, such as the Pequots and regional "River Tribes," escalated, the Poquonock sachems – particularly Nassahegan – ceded land to English settlers, securing alliances that helped shape colonial expansion in

the area. In 1736, portions of Windsor, Farmington, and Simsbury combined to form the parish of Wintonbury, deriving its name from these three towns. Finally, in 1835, the Connecticut General Assembly incorporated this parish as the town of Bloomfield. Initially agricultural, especially in shade tobacco, Bloomfield began to transform into a suburban community of Hartford in the 1950s. Today, its landscape still reflects its mixed legacy of rural terrain in the north and west and more developed, suburban neighborhoods in the south and east. Spanning 26.3 square miles, Bloomfield's geography includes the Farmington River along its northern border and Talcott Mountain – part of the Metacomet Ridge – along its western side. Notable natural attractions, such as Wilcox Park, highlight the region's rugged ridgeline and are traversed by the 62-mile Metacomet Trail.

CURRENT USE

The Town of Bloomfield manages more than 935 acres across 20+ parks and woodlands throughout Bloomfield, CT. These are publicly accessible open spaces, many featuring extensive trails, park infrastructure, and interpretive exhibits. The "Open Space" designation indicates that this area is not used for any single recreational activity and is not considered a managed park. These parks provide valuable green space and walking trails in an otherwise urban landscape, enabling residents and visitors to experience the local ecology up close.

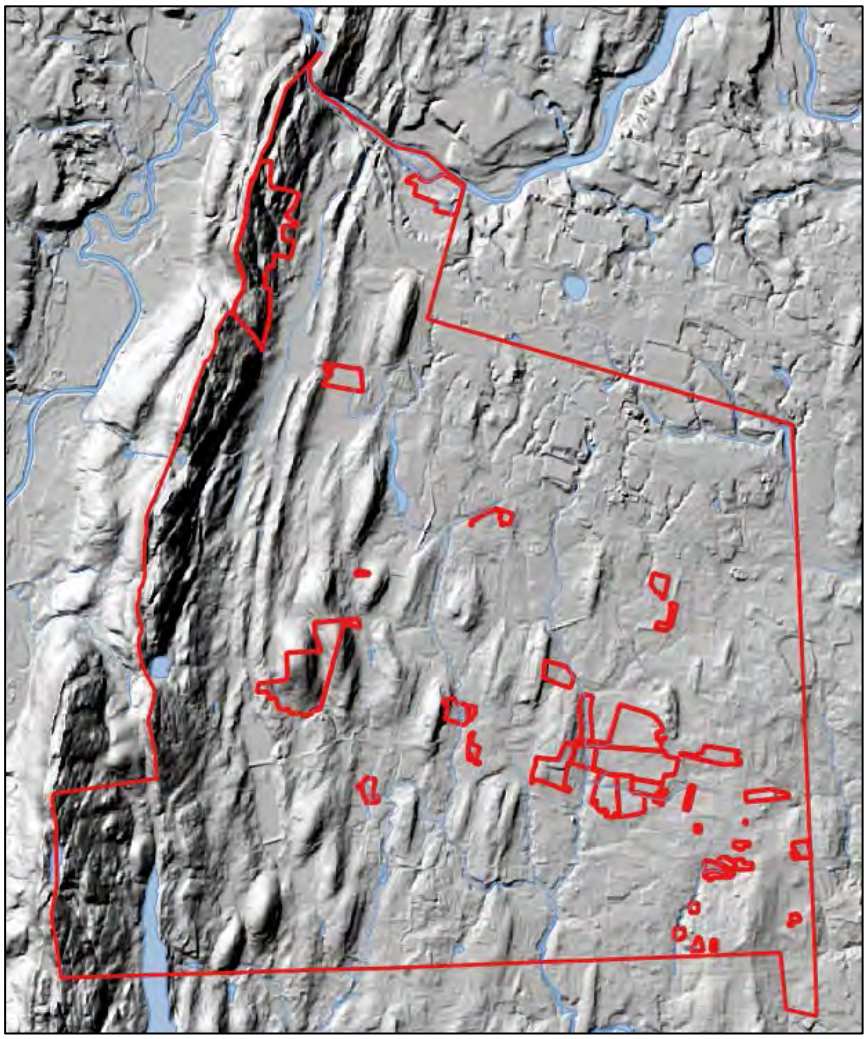


Figure 1: Town of Bloomfield and the 20 properties covered in this FSP on LiDAR showing topography

Parks, especially natural forested areas, provide many of the traditional services that healthy forest lands offer in Connecticut, a state with highly fragmented forest lands. These ecosystem services include habitat for mammals such as deer, foxes, bobcats, and rabbits; habitat for migrating and non-migrating birds; regional resilience to climate change; regional resilience to non-native pests and pathogens; regional resilience to non-native plant species; maintaining high-quality drinking water throughout the watershed; and more.

Maintaining healthy forest land throughout Connecticut, a densely populated state, is critical for all these benefits. Other benefits that forest patches in urban and suburban landscapes provide include stormwater mitigation, improved air quality, reduced urban heat stress, improved mental health, and carbon storage. That said, urban forests are subject to exacerbated biotic and abiotic stressors compared to their rural counterparts. These stressors include altered temperature and precipitation regimes, increased sensitivity to invasive pests and pathogens,

susceptibility to abiotic pollutants such as higher ozone concentrations, nitrogen deposition, heavy metal and road salt loading, and limited growing space (e.g., dense infrastructure and compacted/degraded soils).

BIOPHYSICAL BACKGROUND

Geologic History

The supercontinent Pangea formed and broke apart between 500 million and 150 million years ago. The paleocontinents of Laurentia and Gondwana collided, sandwiching the island chain of Avalonia. They pulled apart: Gondwana became present-day Africa, Laurentia became North America, and Avalonia formed the upland area east of the Connecticut Rift Valley. This violent collision and subsequent break-up dramatically altered the topography, leaving evidence of this event across the landscape.

During formation, the impact of the paleocontinents created the crumpled topography of the Appalachian Mountains, as well as the ridge-valley topography in Connecticut. The heat produced by this impact transformed the existing sedimentary rock into metamorphic schist and gneiss, which now make up the bedrock in the upland regions. As Pangaea began to break apart, enormous forces stretched and pulled the land, producing many cracks in the crust without fully splitting the continents into new ocean basins. This process created rift valleys, and one of these formed the landscape that today includes Connecticut's Central Valley – where Bloomfield is situated today.

The crust thinned and sagged downward in areas where the stretching was greatest, generating considerable heat and allowing magma to rise to the surface. This magma erupted as lava flows, which cooled and solidified into basalt. Over time, softer sedimentary rocks surrounding these basalt layers eroded away, leaving behind the more resistant basalt. Today, these basalt ridges appear as steep, stair-like formations – hence the name "trap rock," derived from the Scandinavian word for "stairs." Landmarks such as the Metacomet Ridge, East Rock, and West Rock are well-known examples of Connecticut's distinctive traprock features.

The coastal region of Connecticut has an underlying geology that was recently shaped by the advancing and receding of the Wisconsin Glacier during the most recent period of glaciation, which ended around 15,000 years ago. The glacier was a mile thick, and as it advanced, it scraped the surface of the ground. As it receded, meltwater and glacial debris – sand, gravel, and larger rocks – were deposited across the region, creating the basis for much of the soil and topography we see today. After the last period of glaciation, Glacial Lake Hitchcock was left, filling the Connecticut Rift Valley with a single lake as far north as present-day New Hampshire. The Traprock ridge near present-day Meriden, CT, directed the lake's outflow to eventually form the Connecticut River that travels east to empty into the Long Island Sound near Old Saybrook, CT.

Bloomfield spans a diverse range of elevations and landforms. The western edge of the town rises steeply to elevations of 950–650 feet above sea level, particularly along the Metacomet Ridge, Talcott Mountain, and Wilcox Park, which are composed of hard volcanic trap rock. These ridges, formed from ancient lava flows, define the town's most rugged topography. Moving eastward, the landscape transitions into broad, gently sloping lowlands with finer sediments, including sands, silts, and alluvial floodplain deposits. The elevations drop to around 130 - 100 feet in the central and eastern parts of town.

Hydrology

There are eight major watersheds in Connecticut. Bloomfield is located within the Connecticut River basin. The Connecticut River Basin, spanning 11,250 square miles from southern Quebec to Long Island Sound, comprises approximately 13 percent of its area in Connecticut, with the remainder spread across Vermont, New Hampshire,

Massachusetts, and a small portion in Quebec. At 280 miles long and up to 60 miles wide, the Connecticut River Basin in CT covers much of Hartford and Middlesex Counties and parts of Tolland, Litchfield, New London, and New Haven Counties.
The 508-square-mile upper Connecticut River basin in north-central Connecticut encompasses the Scantic, Park, Hockanum River, and the Farmington River.

The Connecticut River basin comprises regional, subregional, and local basins, which correspond to varying levels of detail in terms of topography, aspect, and elevation. Most of Bloomfield is situated in the Park River regional basin, with parts also located in the Connecticut Main Stem and Farmington River basins. The Park River originates in Bloomfield, CT, and flows south through Hartford before joining the South Branch and ultimately draining into the Connecticut River. The North Branch Park River is a 5.9-mile stream formed by the confluence of four major tributaries – Beamans Brook, Wash Brook, Filley Brook, and Tumbledown Brook – with an additional 28.7 miles of unnamed tributaries.

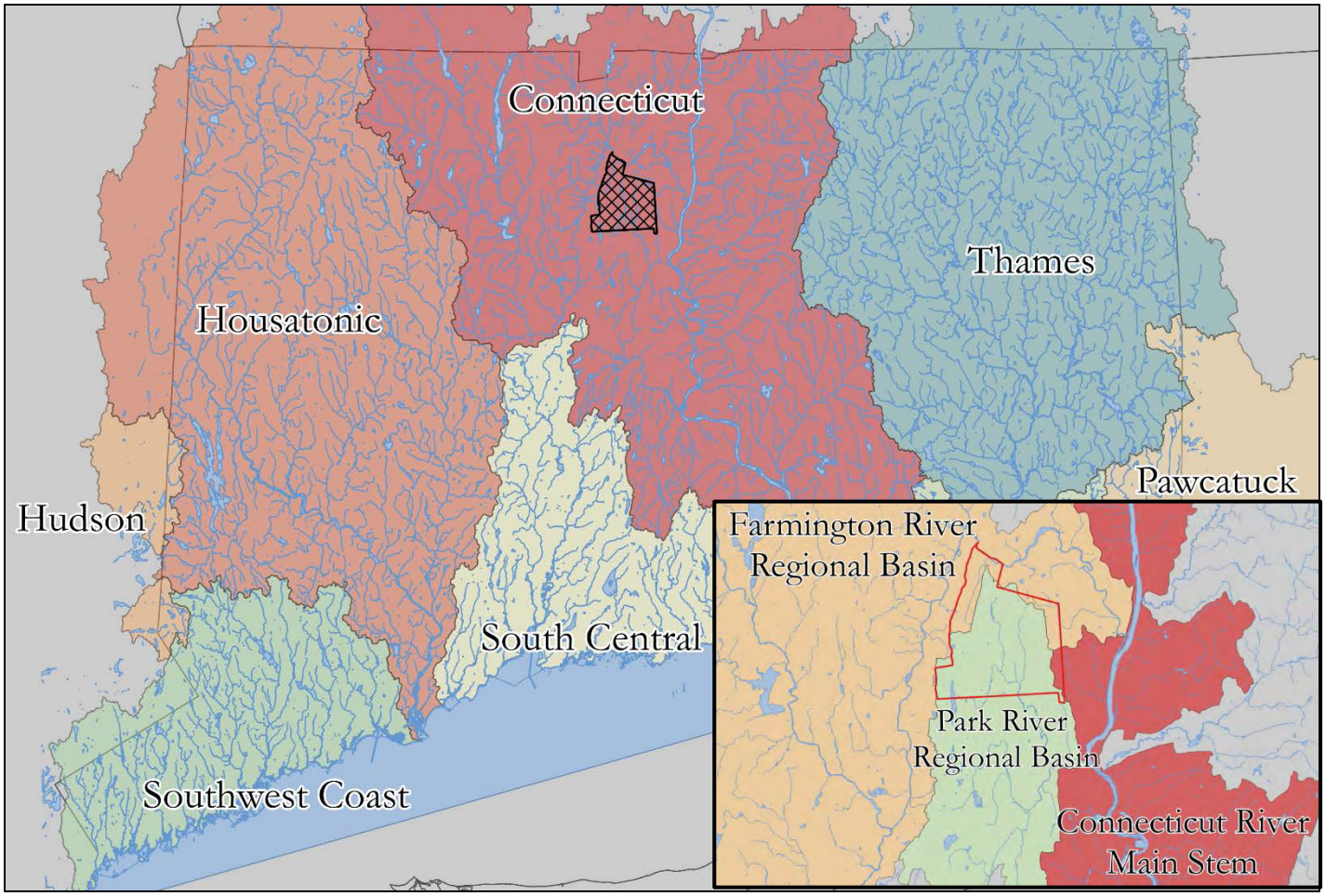


Figure 2: Greater and regional watersheds of Bloomfield CT

Soils

In Connecticut, more than 100 soil types have been categorized and named, each sharing the same wetness, age, parent materials, and climatic legacies. Each of the soil types found on the property is characterized below. Soils were identified and defined using the US Natural Resources Conservation Service (NRCS) soil survey tool. The soils across the Bloomfield properties reflect a diverse geologic history shaped by glacial till, outwash processes, and alluvial deposition. These soil types influence forest composition, site productivity, drainage characteristics, and management constraints. Understanding the physical and chemical properties of these soils is critical to implementing climate-resilient forestry practices and making informed land-use decisions.

Upland areas are dominated by glacial till soils such as Wethersfield, Broadbrook, Ludlow, and Rainbow silt loams. These soils are moderately well to well-drained, with moderate slopes and good fertility, supporting a hardwood forest matrix dominated by sugar maple, northern red oak, white ash, and American beech.

The outwash plains and river terraces across the eastern portions of the properties contain sandy soils such as Elmridge, Merrimac, Windsor, and Ninigret fine sandy loams. These soils exhibit rapid permeability and low water-holding capacity, rendering them prone to drought during dry periods. Forest cover in these areas often includes white pine, red oak, pitch pine, and black cherry.

Low-lying areas contain floodplain and wetland soils, including the Limerick and Lim soil series. These are very poorly drained, silty soils with high water tables and frequent seasonal flooding. Dominant vegetation includes red maple, river birch, black willow, and silver maple. These sites are best suited for passive management or conservation, with development strongly discouraged due to hydrologic sensitivity and the ecosystem services these areas provide, such as flood mitigation and wildlife habitat.

Ridge tops and steep hillsides along the Metacomet Ridge are underlain by rocky, shallow soils such as those in the Cheshire-Holyoke and Holyoke-Rock Outcrop complexes. These soils are well-drained and contain numerous surface rocks and shallow bedrock, which limited development and agriculture. Chestnut oak, black birch, hickory, and red oak are commonly found on these exposed sites. These areas are well-suited for long-term forest conservation due to their limited accessibility and low potential for soil disturbance.

Several parcels include disturbed or developed soils classified as Udorthents, Urban Land, and Urban Complex. These areas are characterized by mixed fill materials, compacted substrates, and altered hydrology. While their natural ecological function is reduced, these areas can be targeted for urban greening and restoration. Together, these soils form a patchwork of forest potential, from productive rocky uplands to drought-prone outwash terraces and wet floodplain corridors.

Picture 2 Scitico, Shaker, and Maybid soils. Poorly drained, fine-textured, silty and clayey soils with very slow permeability.

FOREST DEVELOPMENT

Forests are ecosystems constantly undergoing change. Most of the forests of New England developed from pasture more than 100 years ago. Slowly, trees and other plants crept in and began the process known as succession. Some species of trees and plants are ecologically adapted to full sunlight and are referred to as "early successional" or "pioneer" species. Early-successional plants require full sunlight to grow and often are not as long-lived. As these pioneer species grow and develop, they create conditions better suited for more shade-tolerant species and species that cannot survive in full sun exposure. As the early successional species die off, more shade-tolerant species take their place. Forests do this outside of human timescales; forests will take about 150 years or more to develop into "mature" forests. Even when forests reach these mature stages, they are still undergoing change as adult trees die and create gaps in resources for new growth.

Understory plants, trees, and wildlife are constantly undergoing competition for resources: water, sunlight, and nutrients. Trees are the largest component of a forest and have the most ecological value for flora and fauna, as well as economically for timber. While trees have a tremendous amount of ecological value, creating gaps in forests via disturbances, either natural or human-caused, can create opportunities for less shade-tolerant species and understory vegetation to thrive.

As the 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 could be 500 trees per acre. After 50 years, there will be 200 to 300 trees per acre; in another 40 years, there will be 50 large trees per acre. After 100 years, approximately 97% of the original 5,000 seedlings per acre have died, leaving the remaining 3% of the trees to mature.

The exact number varies from forest to forest, but the process of forest maturation is the same. The other 4,850 trees have died and decomposed because they lost the competition for limited growing space. This process continues until the mature trees die from old age or disease, blow over, burn in a forest fire, or are cut. 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 dies, 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 on this property will die, and the trees growing in the understory will replace them. Therefore, some of the best predictors of the future composition of the forest are often indicated by what is growing in the understory, which changes based on the environmental conditions present.

Foresters can accelerate and improve forest development by selecting the trees that will dominate the stand. A forester may favor the healthiest and most vigorous trees. A forester may favor a tree for its value to wildlife, like the soft mast of a black cherry tree. A forester may favor a tree for its products like sugar maple for syrup. A forester may favor a tree for its longevity or aesthetics, like white oak. A forester can take much of the chance out of the development process by personally guiding how the forest develops, based on the landowner's objectives. Favoring certain trees increases their survival and vigor by opening growing space around the crown. This allows the tree to expand its crown and receive more sunlight. In turn, this increases the tree's photosynthetic capability, making it more resistant to insects and disease problems and will help it grow faster.

In summary, forestry mimics and manipulates natural forest development to produce a healthier and more valuable forest. This scientific manipulation can produce quality wood products, improve wildlife habitat, create recreational opportunities, and form a more attractive forest.

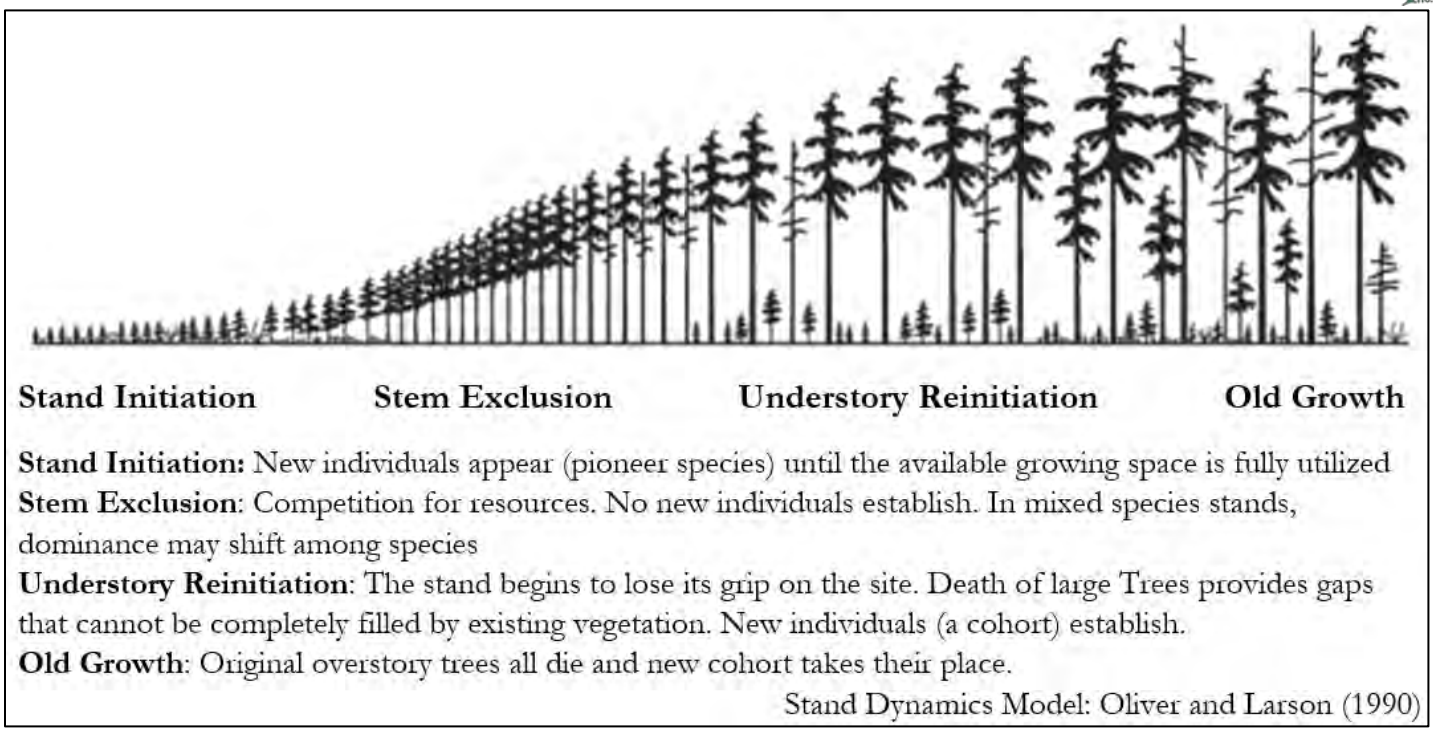


Figure 3 Oliver and Larson's (1990) Stand Dynamics Model, which describes how forest stands typically progress through four broad stages of development. **Stand Initiation** begins when pioneer species establish themselves in open growing space, eventually filling it to capacity. During **Stem Exclusion**, competition for light, nutrients, and water becomes intense, limiting the establishment of new trees and often shifting dominance among species. In **Understory Reinitiation**, the overstory begins to break up as larger trees die or are removed, creating gaps that allow younger cohorts to take hold. Finally, the **Old Growth** stage occurs once the original overstory fully recedes, and a new generation of trees, often of diverse age and species composition, becomes the dominant canopy.

Picture 3 Stone House at LaSallette

Please see below for specific information about each park and recommendations for the next 10 years. Each park is presented with an aerial image identifying property boundaries, soil profile codes, and wetland soils in purple.

Mary Hill Green – .5 Acres

Address and Lat/Long

- 1035 Blue Hills Ave, Bloomfield, CT
- 41°49'17.8"N 72°41'46.3"W

Management Style

- Fully manicured park; trees regularly pruned, mowed, ornamental plantings present.
- High-frequency landscape maintenance (e.g., mowing, shrub trimming).

Soils: Windsor loamy sand (36B, 3–8% slopes)

- Characteristics: Excessively drained, sandy soil with rapid permeability and low available water capacity.
- Topography/Terrain: Found on outwash plains and terraces, with gentle to moderate slopes.
- Typical Tree Species: Pitch pine, white pine, red oak, and black cherry.

Forest Condition

- Trees generally healthy, no significant canopy gaps or obvious hazards.
- Opportunities for increased ecological plantings in ornamental beds.

Invasive Species

- Minimal to no invasive species observed within actively managed areas.

Encroachment

- No clear encroachment or yard-waste dumping issues noted.

Key Takeaways

- Well-maintained, standard urban park environment.
- Potential to incorporate more ecological or pollinator-focused plantings.

Recommendations

- Introduce pollinator gardens to add ecological value.
- Consider planting native understory ornamentals for habitat and aesthetic benefits.

West Eggleston Park – 1 Acres

Address and Lat/Long

- 1 Greenbriar Dr, Bloomfield, CT
- 41°49'16.7"N 72°42'12.5"W

Management Style

- Appears to be moderately managed with some open areas mowed and forest interior left natural.
- Fairly regular mowing under power lines, but less intervention in the wooded area.

Primary Soils: Udorthents-Urban land complex (306)

- Characteristics: Disturbed soils due to urban development, with varying textures and drainage conditions.
- Topography/Terrain: Typically found in developed areas, often with altered slopes and compacted soils.
- Typical Tree Species: Limited vegetation due to urban use, though street trees like red maple, honey locust, and London plane tree might be planted.

Forest Condition

- Overstory includes black birch, cherry, and some white pine regeneration.
- Good understory-midstory-overstory layering, indicating a healthy forest structure.

Invasive Species

- Multiflora rose in some forest edges.
- Japanese knotweed in small patches near power lines.
- Mostly contained due to shading from healthy overstory.

Encroachment

- Some leaf piles and minor dumping at park edges.
- No large-scale property infringement noted, but debris can lead to future dumping.

Key Takeaways

- Healthy overstory is a strong defense against heavy invasive infestation.
- Leaf and minor trash accumulation on edges could expand over time if not addressed.

Recommendations

- Regularly monitor edges for invasive expansion.
- Provide trash receptacles or compost stations near entrances to discourage litter.
- Plant ornamentals and shade trees near benches/sidewalks for aesthetic enhancement.

Sinnot Farm – 2 Acres

Address and Lat/Long

- Deerfield Rd, Bloomfield, CT
- 41°50'56.9"N 72°45'15.2"W

Management Style

- Large open field, likely used as a dog park or recreation area; minimal forest management.
- Routine mowing in the field, limited intervention along forest edge.

Primary Soils: Merrimac fine sandy loam (34A/B, 0–8% slopes)

- Characteristics: Somewhat excessively drained, sandy loam soil with rapid permeability and low water-holding capacity.
- Topography/Terrain: Found on outwash plains and terraces, with nearly level terrain.
- Typical Tree Species: Eastern white pine, red oak, black cherry, and sugar maple.

Forest Condition

- Edges with pin oak, aspen, cherry, and scattered white pine in good shape.
- Mostly open-grown, edge-dominated structure, with mowed lawn interior.

Invasive Species

- Multiflora rose, tree-of-heaven, bittersweet, autumn olive forming dense tickets at edges.
- Some rubus (blackberry/raspberry) growth also present, though less concerning ecologically.

Encroachment

- Some yard-waste and trash scattered at boundaries.
- Not much residential housing directly abutting, but occasional debris suggests passersby littering.

Key Takeaways

- Edge invasives can spread if not regularly controlled.
- White pines currently unaffected by heavy vine load but require monitoring.

Recommendations

- Target tree-of-heaven with removal protocols.
- Regular vine cutting around forest edges to prevent canopy damage.
- Plant canopy trees throughout to create a park like setting.

Pershing Park – 2.5 Acres

Address and Lat/Long

- 1 Allen Rd, Bloomfield, CT
- 41°48'40.9"N 72°41'18.8"W

Management Style

- Small urban park with older canopy trees, frequently pruned but not always following best practices.
- Open park setting, limited understory management.

Primary Soils: Ninigret fine sandy loam (701A, 0–3% slopes)

- Characteristics: Well-drained, fine sandy loam with moderate to rapid permeability and low water-holding capacity.
- Topography/Terrain: Found on nearly level outwash plains and terraces, often near river valleys.
- Typical Tree Species: Eastern white pine, red oak, black cherry, and pitch pine.

Forest Condition

- Most of the canopy is on the park edge between two fences. Trees have grown into the fence.
- Three large canopy trees, one heavily topped and pruned.
- Potentially hazardous red maple and sassafras near power lines; advanced decay/cankers.

Invasive Species

- Japanese knotweed between park fence and neighboring yard.
- Other invasives limited but could encroach from fence-line debris.

Encroachment

- A "double fence" (park fence + cemetery fence) creates a debris/trash corridor.
- Fencing also intersects with some tree trunks, causing damage.

Key Takeaways

- Several high-risk trees need attention (removal or professional pruning).
- Knotweed in fence lines is challenging to eradicate if not tackled comprehensively.

Recommendations

- Remove or prune hazardous trees near power lines.
- Consolidate or remove the double fence to reduce debris buildup.
- Develop a planting strategy to maintain park canopy cover over time.
- If privacy is valued here, consider planting a living fence of arborvitae

Town Hall Grounds – 6.75 Acres

Address and Lat/Long

- 800 Bloomfield Ave, Bloomfield, CT
- 41°49'52.4"N 72°44'13.5"W

Management Style

- Central municipal space featuring ornamental trees and some heritage specimens (e.g., Charter Oak seedling).
- High-visibility location with frequent public use; regular maintenance performed.

Primary Soils: Elmridge fine sandy loam (28A, 0–3% slopes)

- Characteristics: Well-drained, fine sandy loam with moderate to rapid permeability.
- Topography/Terrain: Found on low terraces and alluvial plains, with gentle slopes.
- Typical Tree Species: Sugar maple, red oak, hickory, and white pine.

Forest Condition

- Older trees (maples, oaks, sycamores) have varying planting depths and occasional pruning issues.
- Overall healthy but some stress signals (exposed roots, minor bark damage).

Invasive Species

- Invasives are minimal directly on the Green.
- Forested area has multiflora rose, barberry, and others, likely creeping in from edges.

Encroachment

- No major encroachment, though some yard-waste disposal visible at boundaries.
- Potential property boundary confusion with adjacent sites.

Key Takeaways

- Planting-depth inconsistencies can cause long-term stress.
- The Charter Oak tree has minor structural issues but is still viable.

Recommendations

- Training for maintenance crews on correct planting depth and mulching around exposed roots flares.
- Monitor edges for invasive incursion from neighboring parcels.
- Investigate the possibility of installing a short loop trail in the natural forested section to the south and incorporate interpretive signage that pairs with the arboretum located around the grounds.
- Plant more trees in the town green to enhance public use and aesthetic value.

Lisa Lane Farm – 11 Acres

Address and Lat/Long

- Lisa Lane, Bloomfield, CT
- 41°49'06.5"N 72°41'16.0"W

Management Style

- Minimal, sporadic management; largely overgrown edges.
- Farm site with forested edges.

Primary Soils: Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.

Forest Condition

- Young to mid-size stand with close spacing of red maple, black locust, oak regeneration.
- Wet ground conditions in some areas; canopy is fairly dense but with limited species diversity.

Invasive Species

- Bittersweet, burning bush, Japanese knotweed, and other common invasives at edges.
- Likely spread by yard-waste disposal or farming activities.

Encroachment

- Significant trash piles and debris along edges and throughout the interior.
- Uncertain property lines can lead yard-waste dumping onto public land.

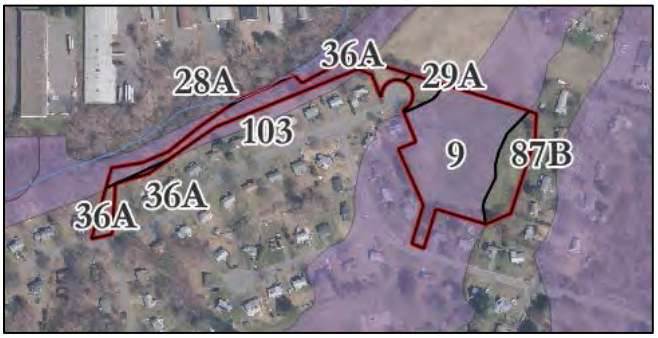
Key Takeaways

- High potential for forest development but severely impacted by trash, yard waste, and multiple invasive species in wet areas and forest edges.
- Dense canopy can be positive for shading out invasives, but large vines threaten overall stand development.

Recommendations

- Organize a clean-up event to remove trash and control invasives.
- Mark boundaries.
- Control invasive vines with mechanical cutting or targeted herbicides.

Essex Park – 12 Acres



Address and Lat/Long

- 9 Essex Ln, Bloomfield, CT
- 41°51'19.6"N 72°43'53.5"W

Management Style

- Moderately managed park; some mowing, some forested, with less intensive understory management.
- Evidence of pruning of large maples and oaks.

Primary Soils: Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.

Forest Condition

- Large canopy trees (maples, oaks) with evidence of heavy limb removal or storm damage.
- Some fence-line trees embedded in old fencing.

Invasive Species

- Multiflora rose, bittersweet, and burning bush along edges and fence lines.
- Minimal presence within deeper canopy, but open patches and debris piles could facilitate spread.

Encroachment

- Debris piles at edges may be from both municipal and adjacent private dumping.
- Fence lines often unclear; some trees straddle boundaries.

Key Takeaways

- Canopy is aging; future risk if large trees aren't replaced.
- Fence entanglement can weaken trees and complicate trunk growth.
- The forested section might be perceived and sometimes used as personal or abandoned property by the neighboring properties.

Recommendations

- Remove or replace outdated fencing where feasible.
- Target invasive plants in open or disturbed patches.
- Plant shade trees to maintain canopy cover and ensure next-generation replacements.

Maplewood Park – 12 Acres

Address and Lat/Long

- 56 Burnwood Dr, Bloomfield, CT
- 41°49'32.5"N 72°45'08.7"W

Management Style

- Stream corridor with partly maintained open fields and unmaintained forest interior.
- Mowing and regular maintenance within the lawn, inner forest mostly untouched.

Primary Soils: Limerick and Lim soils (107, 0–3% slopes, frequently flooded)

- Characteristics: Very poorly drained, silty soil with slow permeability and high available water capacity.
- Topography/Terrain: Found in low-lying floodplain areas with frequent seasonal flooding.
- Typical Tree Species: Red maple, black willow, silver maple, and river birch.

Forest Condition

- Mature canopy species: hickory, oak, black birch, sassafras, plus wetland species in lower areas.
- Downed woody debris provides good habitat; multiple wet spots and potential floodplain conditions.

Invasive Species

- Burning bush, Multiflora rose, Japanese barberry, and some bittersweet are scattered.
- Less invasive presence in the deeper, more shaded forest interior.

Encroachment

- Yard-waste dumping visible along property lines.
- Some areas show extended mowing or land "takeover" by neighbors; boundary lines are unclear.

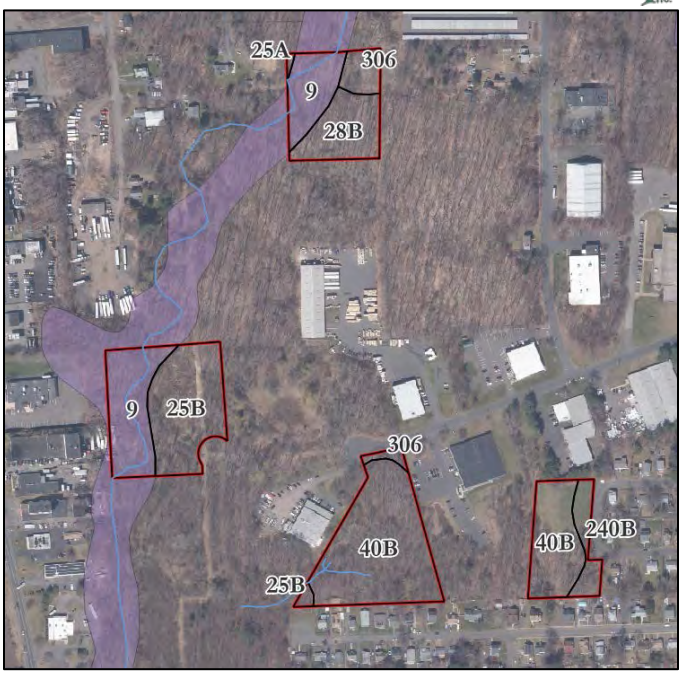
Key Takeaways

- Interior forest is relatively healthy, with diverse understory.
- Edges impacted by invasives and sporadic dumping.

Recommendations

- Focus on edge management of invasive species.
- Reinforce boundaries with signage to deter dumping.
- Plant native buffers to stabilize soils in wet or erosion-prone areas.
- Possible reforestation or plant to create a park like setting
- If reforestation is selected, consider planning a trail that takes park visitors through the forested section

Hubbard Park – 12 Acres



Address and Lat/Long

- Hubard St, Bloomfield, CT
- 41°48'30.7"N 72°42'03.3"W
- 41°48'32.1"N 72°42'12.6"W
- 41°48'32.8"N 72°42'21.7"W
- 41°48'45.2"N 72°42'14.8"W

Forest Summary

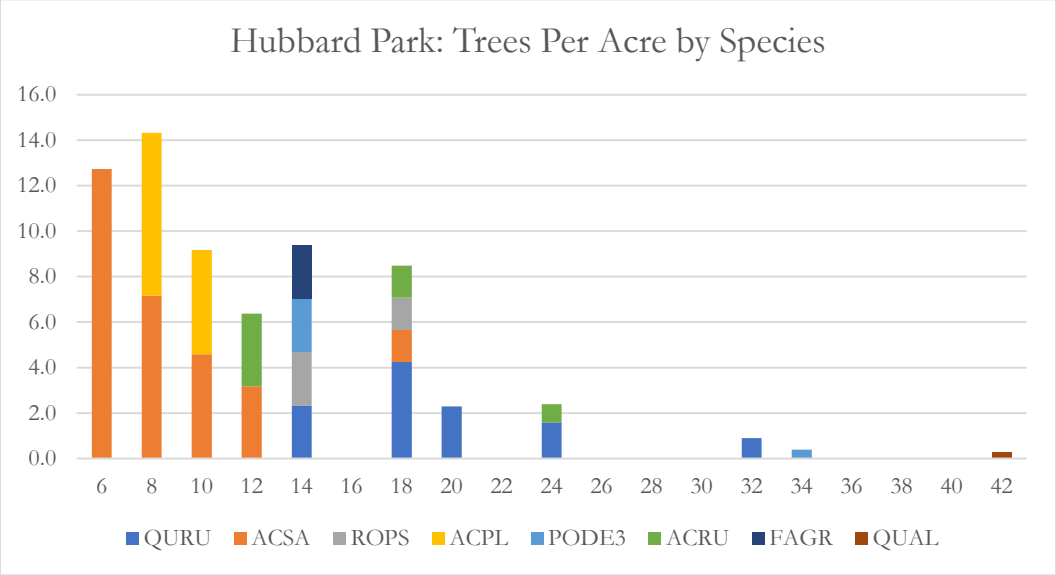
Hubbard Park is a fragmented forest system split into four disconnected patches. The canopy is moderately diverse but clearly dominated by northern red oak (QURU), which contributes approximately 50 ft² of basal area per acre, out of a total 150 ft²/acre, with 110 ft² from sawtimber (trees ≥12") and 40 ft² from pole timber (trees<12"). Tree density stands at 96 trees per acre, composed of 33 sawtimber TPA and 63 pole TPA, with a quadratic mean diameter (QMD) of 12.0 inches – suggesting a stand transitioning into mature overstory dominance.

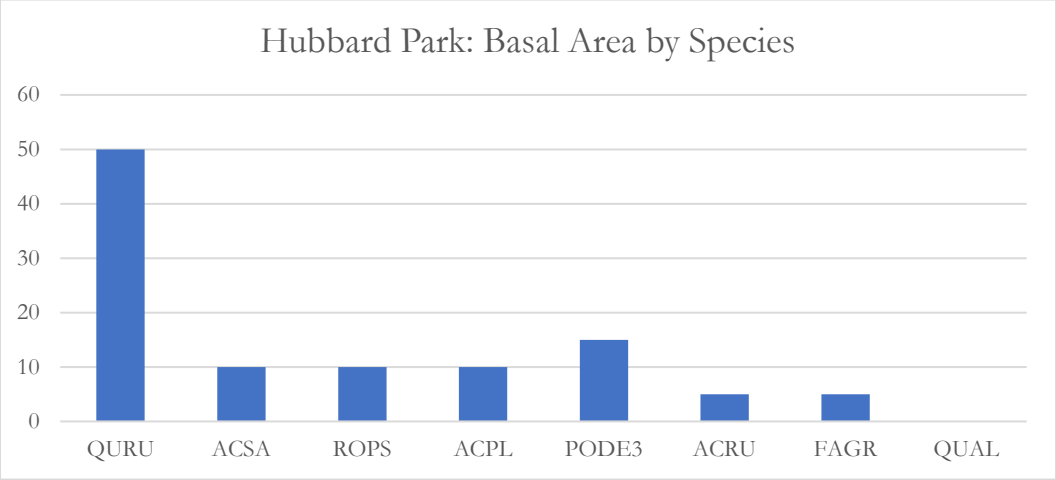
Species composition varies by size class: trees ≥12" DBH are dominated by red oak, red maple (ACRU), eastern cottonwood (PODE3), and Norway maple (ACPL), while the <12" DBH class is heavily populated by sugar maple (ACSA) and Norway maple, hinting at non-native regeneration pressure.

Primary Soils:

- Ludlow silt loam (40B) – moderately well-drained with slow permeability; these gently sloped glacial till uplands support high-quality forest cover and promote oak-maple-beech communities. These soils are productive but prone to erosion on steeper terrain.
- Scitico, Shaker, and Maybid soils (9) – poorly drained with fine textures and very slow permeability, found in lower-lying depressions and wet corners. These areas support red maple, green ash, swamp white oak, and eastern cottonwood, and are more vulnerable to invasive colonization and hydrologic disturbance.

96	Trees/Ac
33	Saw TPA
63	Pole TPA
150	Total BA
110	Saw BA
40	Pole BA
12.0	QMD





Forest Health – Invasives & Pathogens

Forest health is actively threatened by a suite of invasive species, particularly in canopy gaps and around park boundaries:

- Oriental bittersweet (*Celastrus orbiculatus*)
- Multiflora rose (*Rosa multiflora*)
- Tree-of-heaven (*Ailanthus altissima*)
- Japanese knotweed (*Fallopia japonica*)
- Phragmites (*Phragmites australis*) – dominating the wettest areas
- Bush honeysuckle (*Lonicera spp.*) – common near fence lines

Gaps created by blowdowns – particularly over the wetland soils – tend to be rapidly colonized by aggressive invasive vines and shrubs, choking native regeneration. Norway maple, is beginning to form a substantial canopy component, contributes to the long-term loss of native understory diversity and should be treated as ecologically problematic.

No pathogens were explicitly recorded, but given the presence of American beech (FAGR), sugar maple (ACSA), and green ash (FRPE), the site is at risk for:

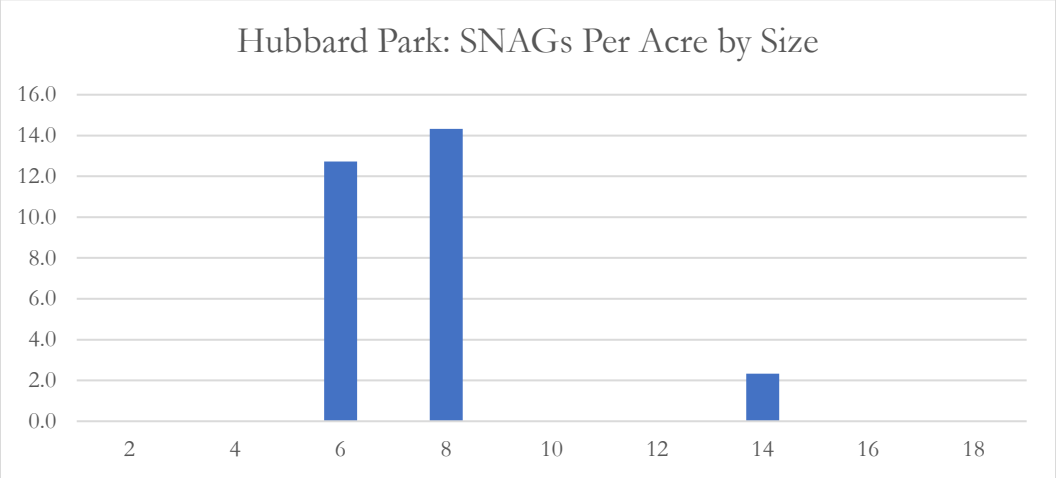
- Beech bark disease

- Beech leaf disease
- Emerald ash borer (EAB) in ash species

Wildlife Habitat

Snags and coarse woody debris (CWD) are abundant and skew toward 6 – 8" DBH classes, which is beneficial for woodpeckers, small mammals, and decomposer species. The site offers valuable multi-strata structure, including mast-producing trees (oaks, hickories), dense midstory, and cavity-forming stems.

Blowdown gaps may serve early successional species like rabbits, towhees, and woodcock if invasives are suppressed. Additionally, the wetland soils support hydrophilic species that could benefit amphibians, wading birds, and reptiles – provided phragmites and knotweed are managed.



Boundaries and Encroachment

There is clear evidence of boundary encroachment, particularly:

- Historical dumping (e.g., bricks, plastic, tarps, metal drums)
- Informal trails and cut-throughs lacking signage or access control
- Edge zones where invasive pressure is highest, likely tied to adjacent residential use or municipal dumping

This compromises both ecological integrity and user safety, and suppresses native regeneration.

Recreation

There is recreation infrastructure in one of the four parcels:

- Lawn and picnic area
- Swings/playground
- Natural forested area that is currently unmanaged

There is potential for:

- Interpretive signage (e.g., invasive ID, wildlife)
- Low-impact nature trails, particularly across the Ludlow soil zones with better drainage
- Shade tree planting to support user comfort and mitigate urban heat island effect.

Management Recommendations

Immediate Priorities:

- Remove dumped materials and conduct visual boundary cleanup
- Begin mechanical and manual invasive removal, especially bittersweet, and knotweed.
- Targeted planting of native species in blowdown gaps (e.g., red oak, sugar maple, swamp white oak)

Short-Term Goals:

- Plant native shade trees and ornamental trees near recreation infrastructure
- Develop invasive species control rotation, focusing efforts on key corridors and access points
- Mark property boundaries with signage

Long-Term Goals:

- Establish a light trail network within the main recreation parcel
- Keep the other three parcels as forest preserve for wildlife

Hubbard Park demonstrates the challenges and opportunities of urban-edge forest management. The forest is ecologically significant despite its fragmentation and invasive burden. Restoration and public engagement can elevate this forest from a passive green space to a resilient, educational, and biodiverse asset to the community.

Joyce Street Park – 14 Acres

Address and Lat/Long

- Joyce St, Bloomfield, CT
- 41°49'27.9"N 72°41'35.8"W

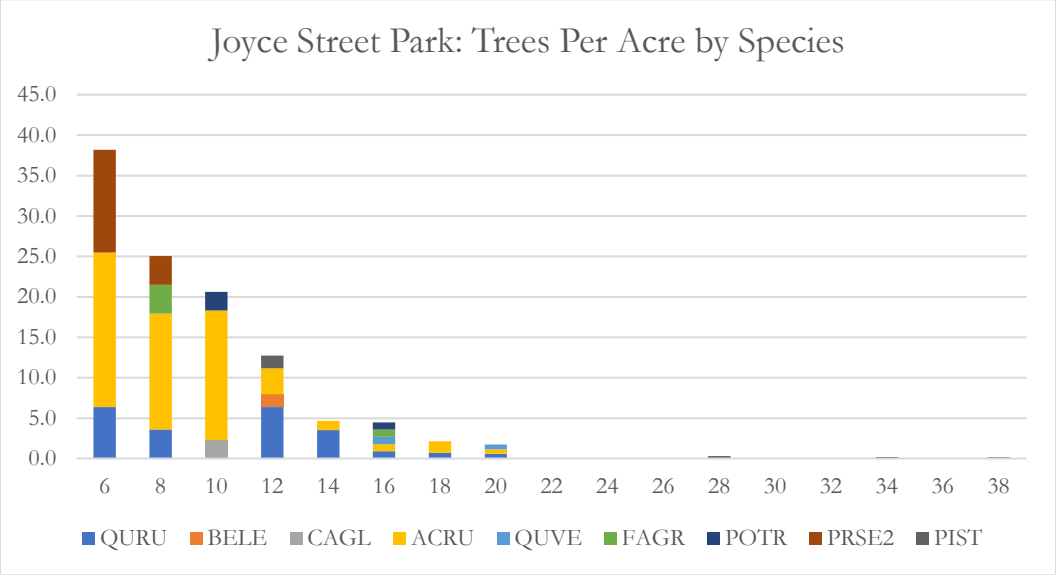
Forest Summary

Joyce Street Park contains 14 acres of lightly managed forest growing on excessively to moderately well-drained outwash soils. The site supports 118 trees per acre with 130 square feet of basal area per acre, split between 70 ft²/acre of sawtimber (≥12") and 60 ft²/acre of pole timber (<12"). The QMD (Quadratic Mean Diameter) is 10.0 inches, indicating a stand dominated by maturing pole-sized trees, with a modest overstory presence. The sawtimber component is relatively scattered but includes older aspen and mid-aged oak.

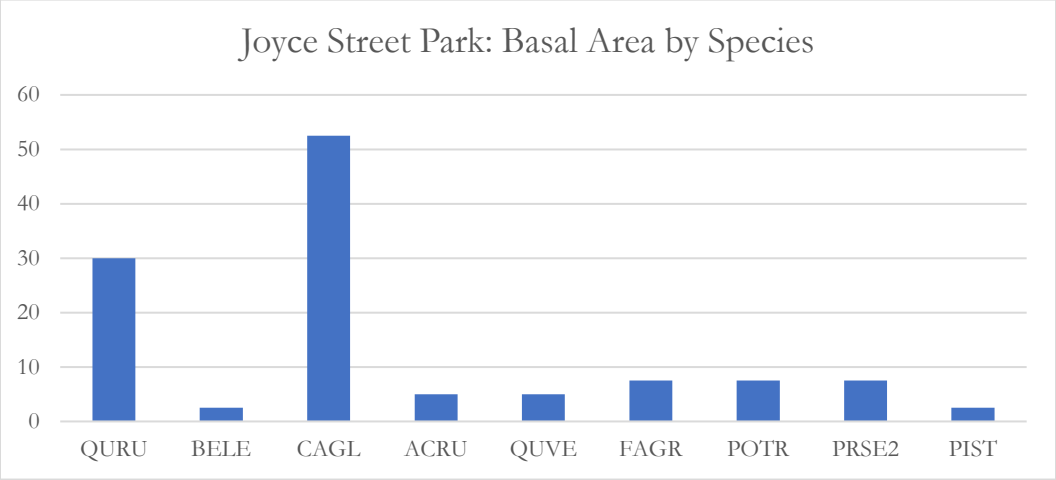
Primary Soils:

- **Windsor loamy sand (36B)** – excessively drained with rapid permeability and low water capacity, found on gentle slopes. Characteristically supports red oak, pitch pine, white pine, and black cherry. These soils promote open forest structure but struggle to retain moisture, favoring drought-tolerant species.
- **Ninigret fine sandy loam (701A)** – well-drained and finer-textured with slightly better water-holding capacity, located on flatter outwash terraces. Suited to white pine, red oak, and black cherry, but also susceptible to rapid drought stress without canopy closure.

The following charts indicate a strong presence of ACRU (red maple), QURU (red oak), and CAGL (pignut hickory) in basal area and stem count, with regenerating components dominated by smaller ACRU, PRSE2 (black cherry), and QURU stems. Sapling red oaks and white pines were also observed in the field.



118	Trees/Ac
28	Saw TPA
90	Pole TPA
130	Total BA
70	Saw BA
60	Pole BA
10.0	QMD



Forest Health – Invasives & Pathogens

Invasive species pose a serious threat to forest regeneration and structural integrity, particularly in edge and midstory zones. Major invaders include:

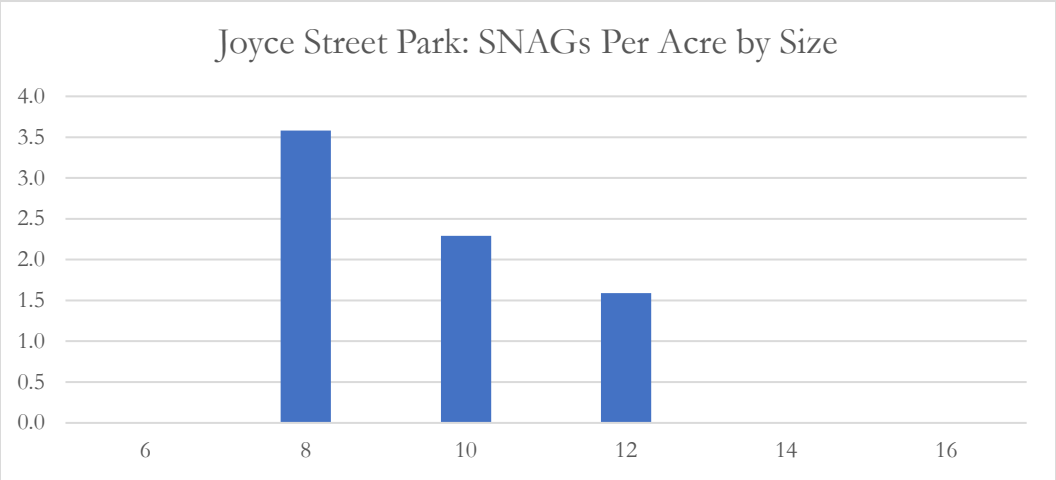
- Burning bush (*Euonymus alatus*) – dense thickets on the right side of the stand
- Oriental bittersweet (*Celastrus orbiculatus*) – climbing and girdling younger trees
- Japanese honeysuckle (*Lonicera japonica*) – suppressing understory regeneration
- Mugwort (*Artemisia vulgaris*)
- Multiflora rose (*Rosa multiflora*)
- Grapevine (*Vitis spp.*) – heavy canopy drapes in some areas

These species are most concentrated in canopy gaps and near outer boundaries, where light penetration and historical disturbance have allowed them to flourish. Midstory strangulation of young pines and pole sized oaks by honeysuckle and bittersweet is a specific threat to future canopy succession.

No active forest pathogens were documented, though the site's sandy soils, if compounded by drought stress, may lead to dieback in sensitive hardwoods or shallow-rooted conifers.

Wildlife Habitat

The site includes moderate coarse woody debris and several standing snags, particularly in the 8 – 12" DBH range, which support woodpeckers, insectivorous birds, and small mammals. The aspen presence in wetter pockets adds habitat diversity, particularly for cavity nesters. Larger downed wood – especially near the small stream corridor – offers cover for amphibians and reptiles, though it is sometimes mixed with debris and dumped material. Habitat quality is increasingly threatened by invasive thickets and vine cover, which reduce native understory diversity and limit the availability of soft mast and foraging cover.



Boundaries and Encroachment

The park's boundaries are poorly defined and suffer from multiple instances of encroachment:

- Basketball court potentially installed on public land – professional survey required to verify
- Neighbor yard waste (branches, leaf litter, fencing) along broken fence sections
- Dumped materials including a car hood, rusted metal, and buckets near a stream channel

These disturbances not only affect aesthetics and property control but also introduce foreign materials that hinder regeneration and complicate habitat restoration. The locked gate and lack of signage create confusion about public access.

Recreation

Currently, public access is restricted due to a locked gate and lack of facilities. There are no trails, benches, signage, or trash management infrastructure. However, the park has strong potential for passive recreation, particularly:

- Low-impact trails
- Interpretive signage on invasive species, forest structure, and wildlife
- Community clean-up events tied to stewardship and education
- Picnic tables and benches for wildlife observation areas

A small loop trail and informational signage would enhance public use while providing access to manage invasive species.

Management Recommendations

Immediate Priorities:

- Open access in a managed way – unlock gate during set hours or install signage explaining public access

- Initiate mechanical/chemical invasive control, starting with:
    - Burning bush thickets
    - Bittersweet and honeysuckle in midstory
    - Multiflora rose and mugwort at edges
- Clarify boundaries, especially near the back of the property, through signage or survey verification
- Organize a clean-up day with volunteers to remove debris and manage invasives

Short-Term:

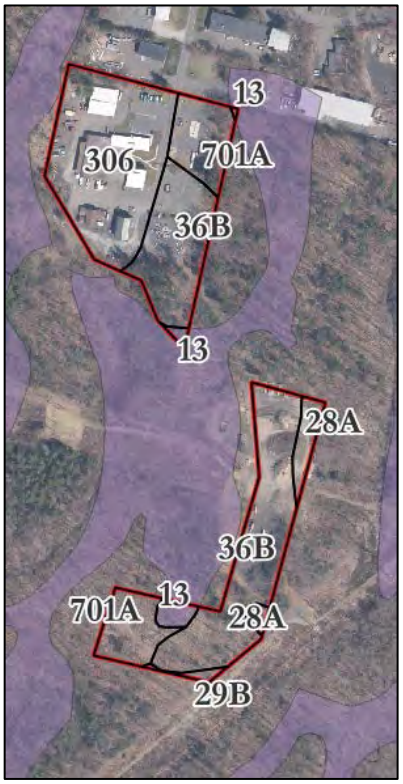
- Begin native planting in cleared areas using species adapted to drought-prone soils:
    - Red oak, Hickory, black cherry, white pine/pitch pine
- Monitor snags and coarse woody debris to maintain wildlife value
- Design and install a basic trail loop with educational signage

Long-Term Goals:

- Maintain a rotating invasive control strategy with seasonal revisits
- Encourage a multi-age forest structure through thinning of vines and targeted gap planting

Joyce Street Park is an underutilized and ecologically stressed urban forest with strong potential for restoration and passive recreation. The combination of sandy outwash soils, a oak-pine canopy, regenerating hardwoods, and stream-side habitat offers a dynamic foundation – provided that invasive species and boundary issues are addressed. With modest infrastructure and thoughtful ecological restoration, the site can be transformed into a resilient and accessible green space for the community.

Public Works – 18 Acres



Address and Lat/Long

- 21 Southwood Dr, Bloomfield, CT
- 41°50'52.6"N 72°42'32.4"W

Management Style

- Well-maintained for municipal storage or operations, with fenced edges.
- Limited direct forest management, though some planting (paper birch, maples) along fence.

Forest Condition

- Large oaks, pines, and minor beech presence near the forest interior.
- Good pockets of white pine regeneration along edges; minimal invasive intrusion.
- Some vernal or seasonal wet spots in area – off property.

Primary Soils: Windsor loamy sand (36B, 3–8% slopes)

- Characteristics: Excessively drained, sandy soil with rapid permeability and low available water capacity.
- Topography/Terrain: Found on outwash plains and terraces, with gentle to moderate slopes.
- Typical Tree Species: Pitch pine, white pine, red oak, and black cherry.
- Use and Management: Best suited for forestry or select agricultural uses where irrigation is available. Drought conditions limit crop productivity.

Invasive Species

- Surprisingly few invasives, though small patches of multiflora rose and minor bittersweet near edges.
- Occasional weed-whacker damage around newly planted trees.

Encroachment

- No real encroachment

Key Takeaways

- This site is in relatively good ecological condition with promising white pine regeneration.
- Fence-line vegetation is minimal but occasionally damaged by maintenance tools.

Recommendations

- Protect Young Trees: Install mulch rings and deer guards to prevent string trimmer and deer damage.
- Monitor Fence Lines: Remove or prune encroaching vines or rose before they expand.

Filley Park – 19 Acres

Address and Lat/Long

- Tunxis Ave, Bloomfield, CT
- 41°50'03.8"N 72°44'16.4"W

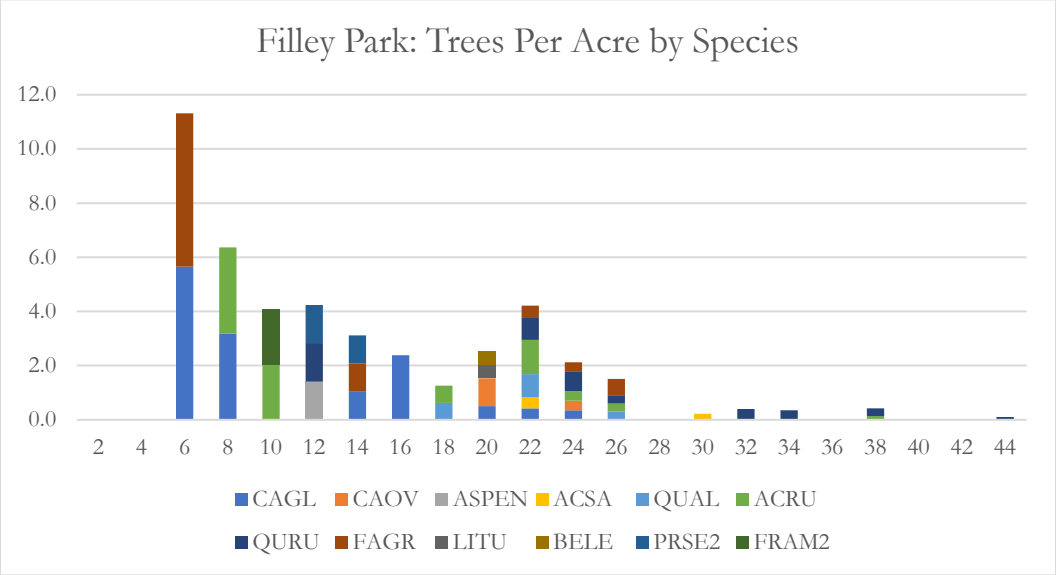
Forest Summary

Filley Park is a mixed-use urban forest with strong ecological and recreational value. The stand supports 47 trees per acre, totaling 127 ft² of basal area per acre – a high value for an urban site – with 113 ft²/acre of sawtimber (≥12") and 13 ft² of pole timber (<12"), and a quadratic mean diameter (QMD) of 15.7 inches. These metrics indicate a mature canopy structure, with individuals exceeding 36 inches in diameter.

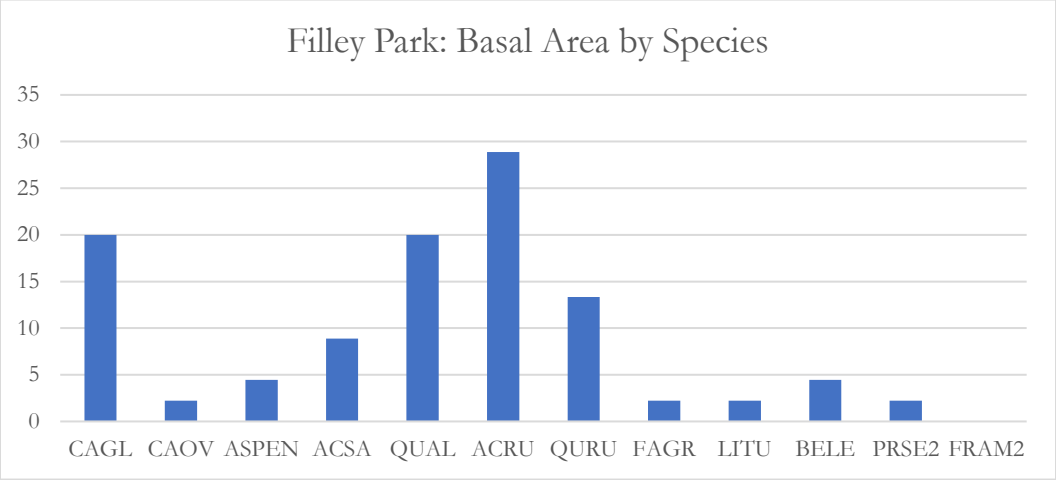
The basal area and species distribution charts show a mixed hardwood stand featuring:

- Red maple (ACRU) – leading in basal area
- White oak (QUAL) and pignut hickory (CAGL) – high structural and ecological value
- Red oak (QURU) and beech (FAGR) – aging canopy components, the latter impacted by bark and leaf disease
- Scattered tulip poplar (LITU), black cherry (PRSE2), black birch (BELE), and ashes (FRAM2) – common near disturbed edges

Saplings are dominated by ACRU, CAGL, and FAGR, suggesting regeneration is occurring but skewed toward shade-tolerant and/or invasive-susceptible species. Trees ≥12" exhibit a broader distribution including valuable wildlife and hardwood species, although stem counts are limited.



47	Trees/Ac
25	Saw TPA
22	Pole TPA
127	Total BA
113	Saw BA
13	Pole BA
15.7	QMD



Primary Soils: Broadbrook silt loam (82C, 8–15% slopes)

- Characteristics: Moderately well-drained, fine-textured silt loam with moderate permeability and good fertility.
- Topography/Terrain: Found on rolling terrain with steeper slopes, often on glacial uplands.
- Typical Tree Species: Sugar maple, red oak, white pine, and black birch.
- Use and Management: Suitable for forestry and limited agriculture, though erosion control is necessary on steeper slopes. Conservation tillage and terracing may help maintain soil stability in agricultural applications.

Limerick and Lim soils (107, 0–3% slopes, frequently flooded)

- Characteristics: Very poorly drained, silty soil with slow permeability and high available water capacity.
- Topography/Terrain: Found in low-lying floodplain areas with frequent seasonal flooding.
- Typical Tree Species: Red maple, black willow, silver maple, and river birch.
- Use and Management: Best suited for wetland conservation, forestry, or limited grazing. Due to frequent flooding, development is not recommended.

Forest Health – Invasives & Pathogens

Forest health is a primary concern at Filley Park. Invasives are clustered along disturbed margins, culvert outflows, forest edges and along the trail. Key species include:

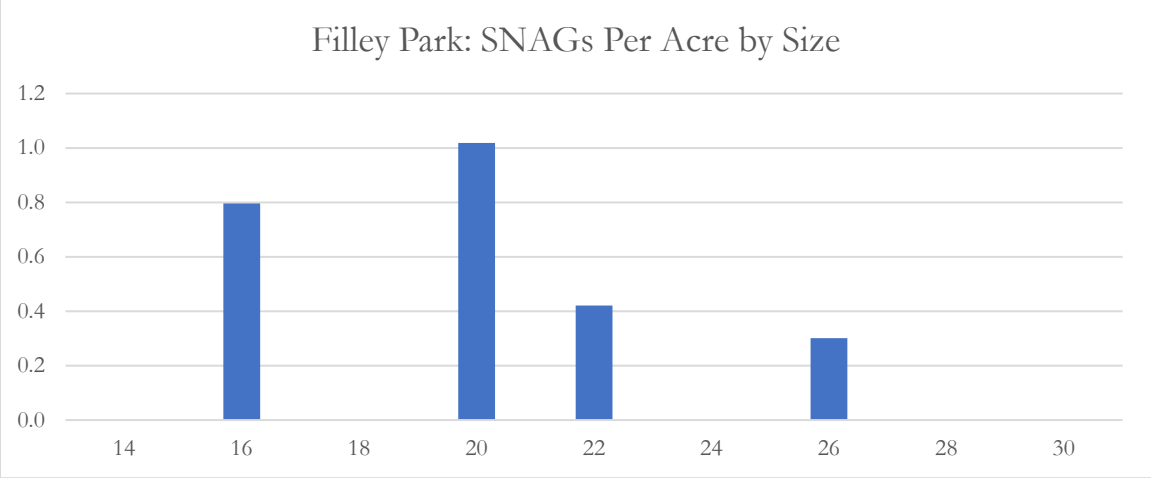
- Japanese barberry (Berberis thunbergii) – widespread along the trail and suppresses native regeneration
- Burning bush (Euonymus alatus) – well-established along edges
- Multiflora rose (Rosa multiflora) – in disturbed thickets
- Grapevine (Vitis spp.) – draping over saplings and mid-canopy
- Japanese knotweed (Fallopia japonica) – concentrated around culverts and disturbed wet zones

Beech bark and leaf disease is present, leading to crown dieback and eventually tree mortality.

Wildlife Habitat

Snag data shows limited but meaningful presence, with snags in the 16–26" DBH range. These large-diameter standing dead trees support a variety of cavity-nesting birds and bats. The mix of mast-producing hardwoods (oaks, hickories), softwood edges (white pine, cottonwood), and coarse woody debris near the wet zone creates a strong foundation for diverse wildlife habitat.

Midstory complexity is heavily shaped by invasives, but greenbrier, downed aspen, and some legacy canopy trees still contribute important habitat structure. Beech groves (even diseased) offer temporary cover and foraging potential. The stream corridor and adjacent lowland offer amphibian and insect habitat.



Boundaries and Encroachment

Filley Park's boundaries are urbanized and face multiple challenges:

- Trash and debris from adjacent property (e.g., grocery store)
- Cemetery edge with aging canopy trees and little replanting effort
- Poor nursery stock and improper tree installation in the manicured portion of the park (e.g., poorly staked trees planted too high or too low)

These conditions contribute to aesthetic decline, tree mortality, and risk of further invasive colonization. Partnerships with community members will be essential to maintain forest health and success.

Recreation

The site includes:

- An existing trail system
- Ornamental/memorial plantings
- A land use history and notable people display

There is opportunity to:

- Improve trails through erosion control and invasive management
- Install interpretive signage (e.g., native species, invasive threats)
- Expand educational outreach via community walks or stewardship programming

Filley Park can serve as both a biodiversity reserve and a cultural landmark.

Management Recommendations

Immediate Priorities:

- Manual and chemical invasive removal, starting at:
    - Cemetery edges
    - Culvert/wet areas
    - Grocery store fence line
    - Along trail edge
- If feasible, correct improper tree plantings (lift root flares, adjust staking as needed)
- Snag retention policy – inventory and preserve non-hazardous large snags
- Organize a trash removal event at boundary edges

Short-Term Goals:

- Begin supplemental planting in gaps with:
    - Red oak, white oak, sugar maple, pignut hickory, and black birch
- Develop a tree health monitoring program (focusing on beech, ash, and maple)
- Integrate soil erosion mitigation (e.g., mulching, shrub-layer establishment) on steeper Broadbrook slopes

Long-Term Goals:

- Encourage a successional structure through light thinning and understory planting in canopy gaps
- Monitor stream health and culvert flow, especially in relation to knotweed spread

Filley Park is a valuable urban forest and cultural landscape with significant mature canopy trees, diverse native species, and manicured park infrastructure. Its challenges – mainly invasive pressure, encroachment, and maintenance of plantings – are manageable with targeted ecological restoration and community involvement. With thoughtful intervention, the park can thrive as both an urban ecological refuge and a place of cultural memory.

Laurel School – 20 Acres

Address and Lat/Long

- 1 Filley St, Bloomfield, CT
- 41°50'14.4"N 72°43'21.0"W

Management Style

- School grounds with a mix of mowed lawn, steep forested slopes, and fence-line corridors.
- Minimal direct management of slope forests or invasive shrubs.

Forest Condition

- Steep edges with oak, maple, some poplars, and willow in damp area.
- Trash accumulation (especially from uphill neighbors) tumbles into forest patches.
- Some open patches provides a mix of shrubby early successional habitat.

Primary Soils: Udorthents-Urban land complex (306)

- Characteristics: Disturbed soils due to urban development, with varying textures and drainage conditions.
- Topography/Terrain: Typically found in developed areas, often with altered slopes and compacted soils.
- Typical Tree Species: Limited vegetation due to urban use, though street trees like red maple, honey locust, and London plane tree may be planted.
- Use and Management: Primarily used for urban infrastructure, with minimal agricultural or forestry potential. Green infrastructure, such as rain gardens and tree plantings, can improve environmental resilience.

Invasive Species

- Bittersweet, autumn olive, multiflora rose common along forest edge and steep slopes.
- Mowed areas keep invasives down in flat sections, but slopes are a "hot spot" due to difficulty of access.

Encroachment

- Visible yard-waste dumping from residences at the top of the slope.
- Fences in poor condition, allowing vines and debris to accumulate.

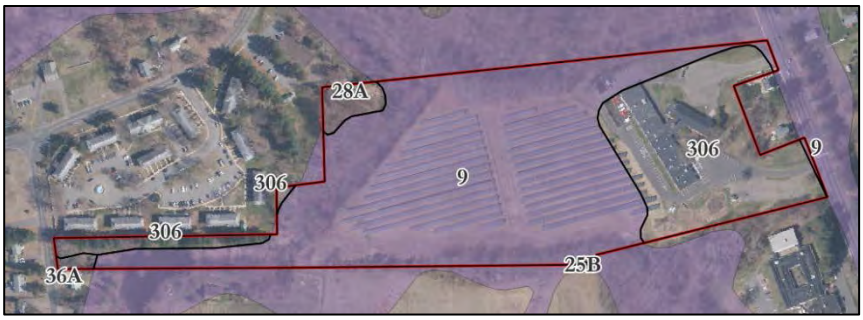
Key Takeaways

- Steep terrain complicates management; slope edges form a corridor for persistent invasives.
- Yard-waste from neighbors accelerates vine and shrub spread downhill.

Recommendations

- Fence maintenance & signage to discourage dumping from upper neighbors
- Mechanical cutting or careful spot treatment of invasives to prevent canopy damage.

Board of Education – 22 Acres



Address and Lat/Long

- 1133 Blue Hills Ave, Bloomfield, CT
- 41°49'44.2"N 72°41'57.0"W

Management Style

- Wetland-rich site with a large solar installation and forested buffers.
- Mowed lawns in select spots; certain fields left to reforest naturally.

Forest Condition

- Pin oak, red maple, poplar/cottonwood, and some hickories in low-lying wet areas.
- Generally healthy mid-canopy with limited major canopy die-off.
- Early successional regeneration observed where mowing ceased (small oaks, cherries, white pine).

Primary Soils: Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.
- Use and Management: Best suited for wetland conservation or low-impact forestry. Poor drainage makes these soils unsuitable for row crop agriculture, and development requires significant drainage infrastructure.

Invasive Species

- Multiflora rose and bittersweet near old dumping areas and yard-waste piles.
- Certain fence-line segments have vines and honeysuckle expanding into the canopy.
- Phragmites in adjacent wetlands, though not widespread on the property interior.

Encroachment

- Some uncertain boundaries with adjacent apartments or businesses, where old junk, asphalt, or brush is piled.
- Evidence of municipal or contractor dumping in one problematic corner (tires, wood scraps).

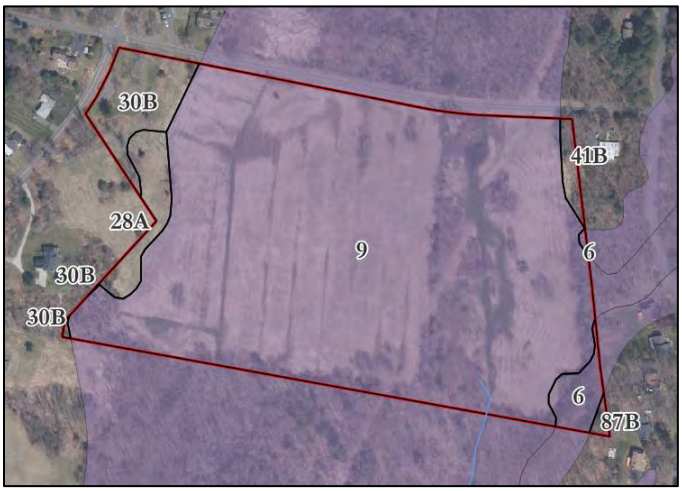
Key Takeaways

- Much of the site is in relatively good shape for a wetland-edge property.
- Dumping hotspots create localized invasive trouble, especially around fences and cleared corridors.

Recommendations

- Remove large debris (tires, asphalt) to reduce disturbance that favors invasives.
- Monitor and lightly manage areas where young oaks, cherries, and pines are emerging.
- Cut or treat bittersweet and rose at the edges before they fully invade canopy trees.

Vista Gardens – 28 Acres



Address and Lat/Long

- 177-129 Duncaster Rd, Bloomfield, CT
- 41°52'19.4"N 72°45'29.1"W

Management Style

- Maintained as a hybrid old-field and semi-landscaped space.
- Site appears managed; regular or annual mowing, some boundary edges have clear signage, while others do not.

Primary Soils: Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.

Forest Condition

- Dominant species include sugar maple, Norway spruce, pin oak, red maple in swampy edges, paper birch, and some regenerating white pine.
- Presence of "wolf trees" at edges (large open-grown trees).
- Red dogwood and speckled alder in wet areas.
- This site is ecologically important for wildlife – grassland, shrubby wetland, and closed canopy

Invasive Species

- Oriental bittersweet and multiflora rose occur, especially on edges.
- Multiflora rose occurs throughout the field
- Some Japanese barberry and Japanese knotweed in the forest edges.

Encroachment

- Yard-waste dumping from adjacent residential areas.
- Property lines poorly marked in some areas, allowing debris to accumulate on or near boundaries.

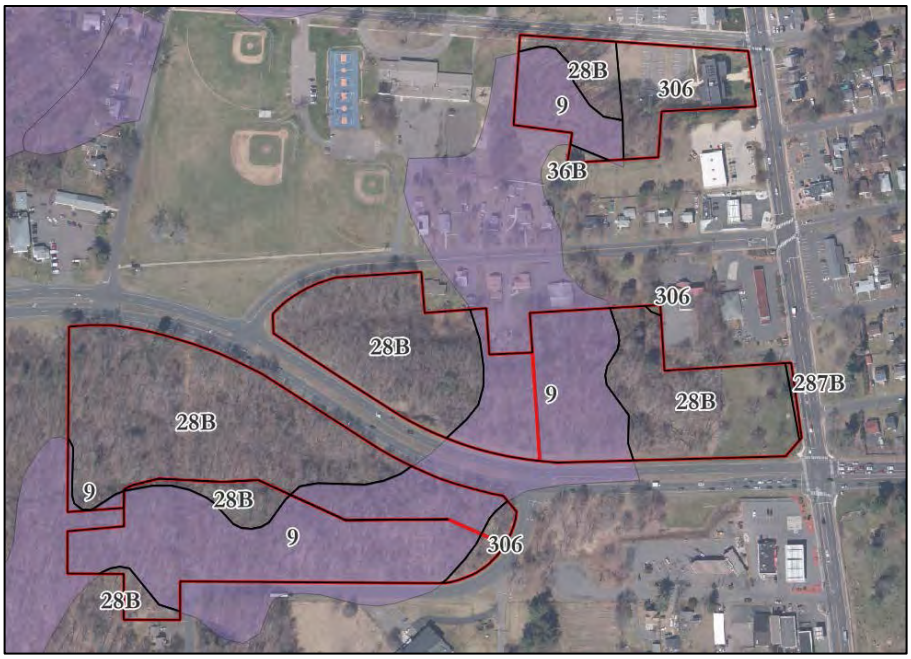
Key Takeaways

- Edges are relatively diverse with native dogwood, alder, but threatened by vine proliferation.
- Monitoring required to prevent aggressive invasive spread.

Recommendations

- Remove invasive vines near valuable trees.
- Clarify boundaries with signage to discourage yard-waste dumping.
- Monitor for new invasives and keep existing native shrubs healthy.
- Explore opportunities for grassland restoration
- Install bird boxes in grassland areas. Many grassland birds, like American kestrels and bluebirds, prefer to nest in cavities.

Rockwell Park – 33 Acres



Address and Lat/Long

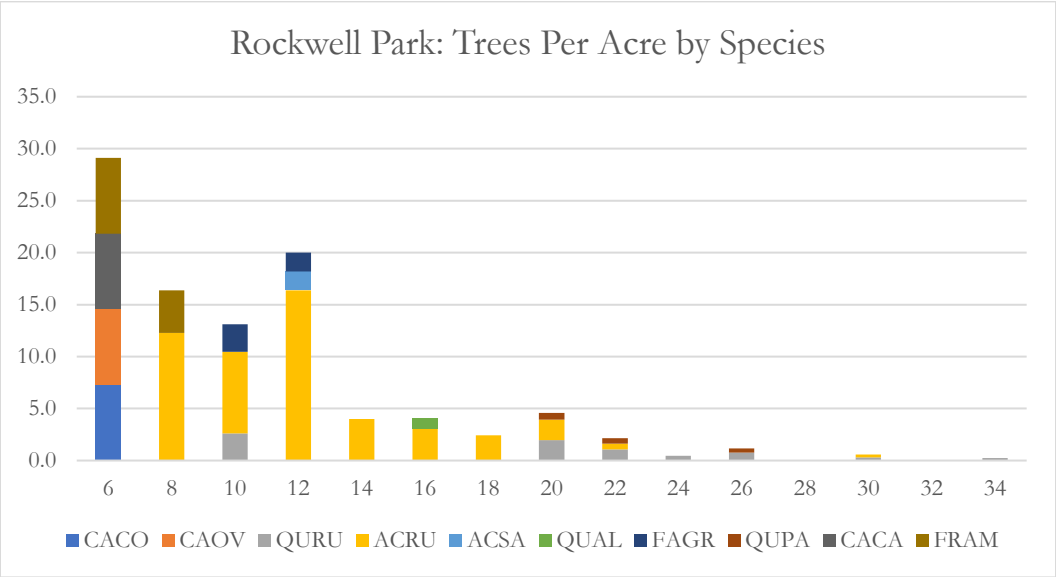
- 73 Rockwell Ave, Bloomfield, CT
- 41°49'02.6"N 72°41'55.1"W

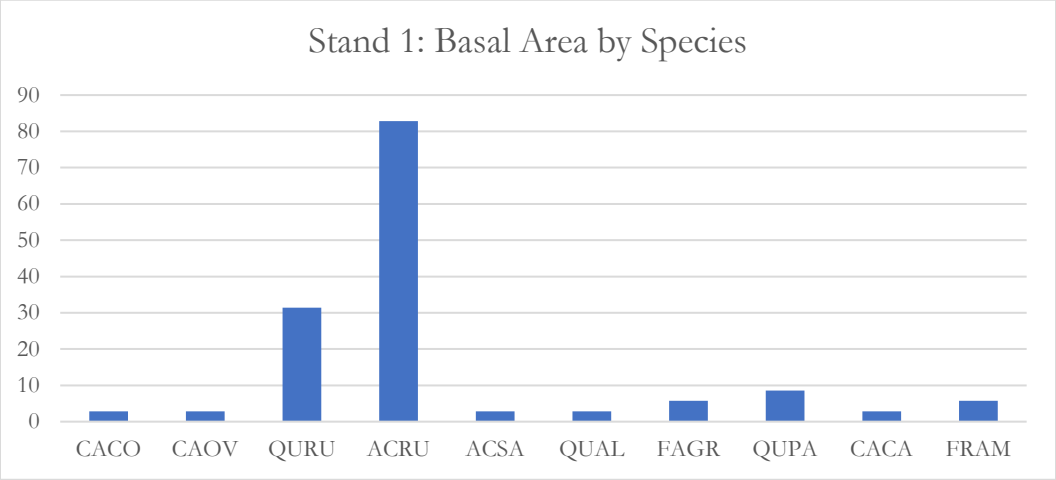
Forest Summary

Rockwell Park primarily features unmanaged forest with a pocket maintained by mowing. Rockwell Park is a moderately stocked, diverse forest comprising 99 trees per acre, with 41 sawtimber (≥12") TPA and 59 pole (<12") TPA, totaling 151 ft²/acre of basal area, of which 114 ft² is in sawtimber. The Quadratic Mean Diameter (QMD) is 11.8", indicating a canopy structure that includes both mature trees and a regenerating midstory.

Species composition is heavily dominated by red maple (ACRU), which accounts for over half the stand basal area. Other notable species include red oak (QURU), American beech (FAGR), white oak (QUAL), bitternut and shagbark hickories (CACO, CAOV), and ash (FRAM). The red maple presence is especially strong in both large and small diameter classes, reflecting site hydrology and successional dynamics.

99	Trees/Ac
41	Saw TPA
59	Pole TPA
151	Total BA
114	Saw BA
37	Pole BA
11.8	QMD





Primary Soils: Elmridge fine sandy loam (28B, 3–8% slopes)

- Characteristics: Well-drained, fine sandy loam with moderate permeability and slight erosion risk.
- Topography/Terrain: Found on terraces and alluvial plains with gentle to moderate slopes.
- Typical Tree Species: White pine, red oak, sugar maple, and hickory.
- Use and Management: Suitable for agriculture, forestry, and residential development, though soil conservation practices should be implemented to reduce erosion on steeper slopes.

Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.
- Use and Management: Best suited for wetland conservation or low-impact forestry. Poor drainage makes these soils unsuitable for row crop agriculture, and development requires significant drainage infrastructure.

Forest Health – Invasives & Pathogens

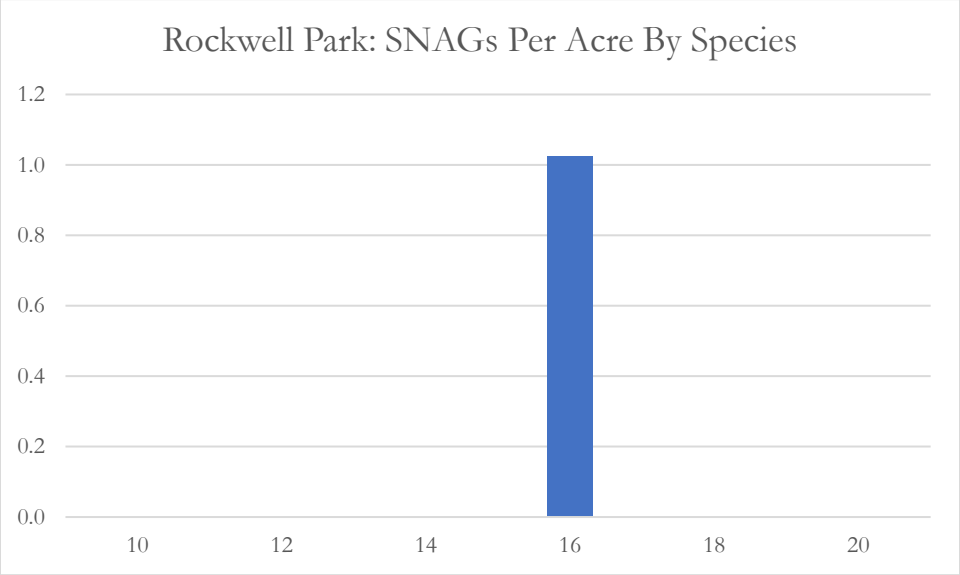
Forest health at Rockwell Park is first impacted by canopy loss due to emerald ash borer (EAB) and second by widespread invasive plant presence.

- Multiflora rose tends to dominate edges and wet stream corridors, forming impenetrable thickets.
- Bittersweet vines are encroaching canopy gaps and along forest edges.
- Porcelain berry is casting its net across edge shrubs and making its way into the canopy.
- Glossy buckthorn and honeysuckle are common in the midstory, especially near mowing edges.
- Ash mortality has been confirmed throughout; ash has been heavily affected by EAB, with few showing signs of healthy growth.

This invasive community is concentrated at the edges but advancing into the interior wherever light and canopy gaps occur. Despite this, interior areas have retained valuable forest structure, a decent canopy closure, and a relatively healthy native composition.

Wildlife Habitat

Rockwell Park provides valuable wildlife habitat due to its diverse ecological features and structural complexity. The site supports a range of wetland vegetation, including red-osier dogwood, skunk cabbage, ferns, and spicebush, creating favorable conditions for amphibians and moisture-dependent species. While snags were visually noted, few were formally sampled—though their presence, offers important nesting and foraging habitat for cavity-nesting birds. Coarse woody debris (CWD) is abundant throughout the park, providing essential shelter and microhabitats for salamanders, small mammals, and invertebrates. One area near the road may function as a vernal pool, potentially supporting amphibian breeding, though it is at risk from vehicle runoff and invasive plant pressure. Despite red maple's dominance in the canopy, overall species diversity is strong, with oak, hickory, cherry, beech, and white pine all contributing to the ecological richness of the park.



Boundaries & Encroachment

The park's boundaries are vulnerable to disturbance, particularly along road-adjacent edges. Multiple instances of trash accumulation – including tires, oil containers, and yard debris – were observed in the forest edge. Yard-waste disposal from neighboring properties is likely exacerbated by a lack of formal signage. These behaviors threaten ecological integrity, promote invasive spread, and diminish the park's public value.

Recreation Opportunities

Recreational infrastructure at Rockwell Park is minimal. For most of the park, there are no formal trails, signage, or visitor amenities beyond mowed roadside clearings and one park like setting.

However, the park offers strong potential for low-impact passive recreation, strategic placement of picnic tables or benches in mowed patches to invite public use without major investment. Between the library and the school there is a section with well-spaced mature trees and a thick invasive midstory that could be reimagined as a savanna-like public forest space – a forest classroom.

Management Recommendations

Immediate Priorities:

- Begin cutting and treating bittersweet vines along edges and access points. Prioritize visible areas first to discourage further spread.
- Coordinate a cleanup event with town staff or local volunteers to remove roadside litter, tires, and dumped debris from park boundaries.
- Install basic signage at key entry points to establish a visible presence and deter dumping or off-property yard waste disposal.

Short-Term Goals:

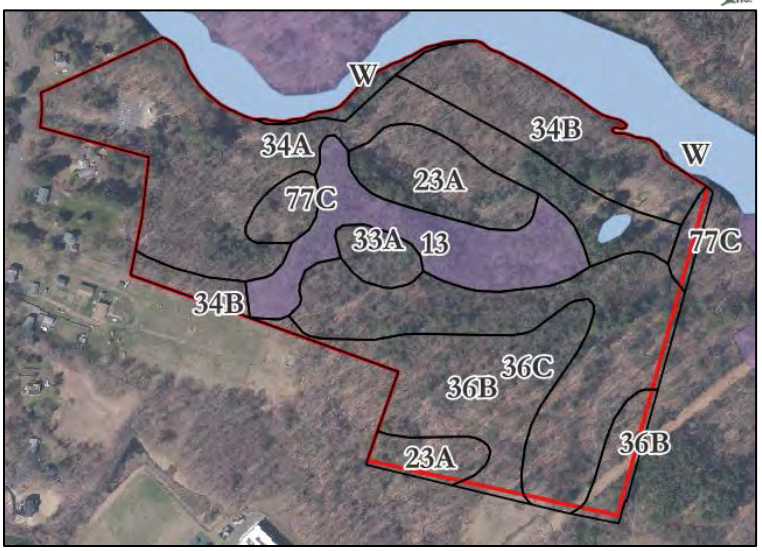
- Expand invasive species management deeper into interior edges, focusing on multiflora rose and glossy buckthorn in areas planned for public use.
- Evaluate stormwater flow near road edges and consider minor interventions like mulching, check dams, or buffer plantings to slow runoff and reduce sedimentation.
- Establish a connection with local groups or schools to support ongoing maintenance and environmental education.

Long-Term Goals:

- Design and implement a forest classroom space next to the library. This will require aggressive brush cutting and potential herbicide applications as well as the spreading of much and grass seed to create a park like setting. Include picnic tables and interpretive signage on forest succession, soils, and invasive species control. (See map in Appendix A)
- In former ash-dominated sections, guide natural succession by periodically assessing and thinning aggressive competing vegetation, encouraging native seedlings.
- Develop a basic forest health and invasives monitoring plan, revisited every 3–5 years to assess species composition, regeneration, and management effectiveness.

Rockwell Park remains an ecologically valuable urban forest despite substantial edge degradation and invasive pressure. Its core forest stands retain strong structural diversity, wetland complexity, and moderate regeneration. By focusing on boundary stabilization, invasive control, and low-impact recreational enhancements, the town can protect and activate this green space as a natural and educational asset for the broader community.

Farmington River Park – 90 Acres



Address and Lat/Long

- 458 Tunxis Ave, Bloomfield, CT
- 41°53'33.0"N 72°44'40.9"W

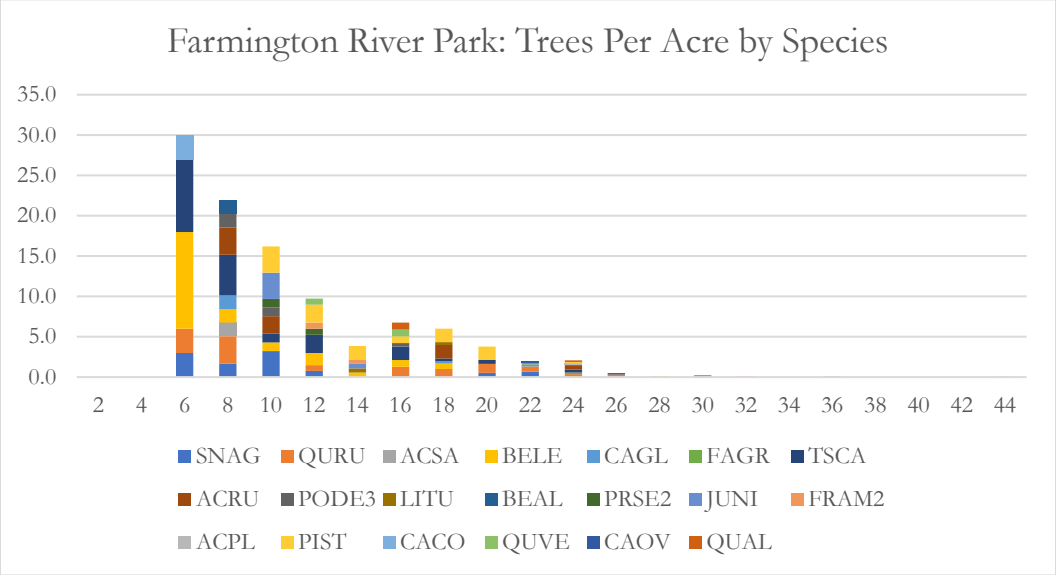
Forest Summary

Farmington River Park encompasses a large, diverse forested area with 103 trees per acre and a total basal area of 159 ft²/acre, consisting of 114 ft² from sawtimber (≥12") and 45 ft² from pole timber (<12"). The QMD of 11.9 inches reflects a maturing forest with good structural complexity, confirmed by species charts that show both significant overstory trees and a diverse regenerating midstory.

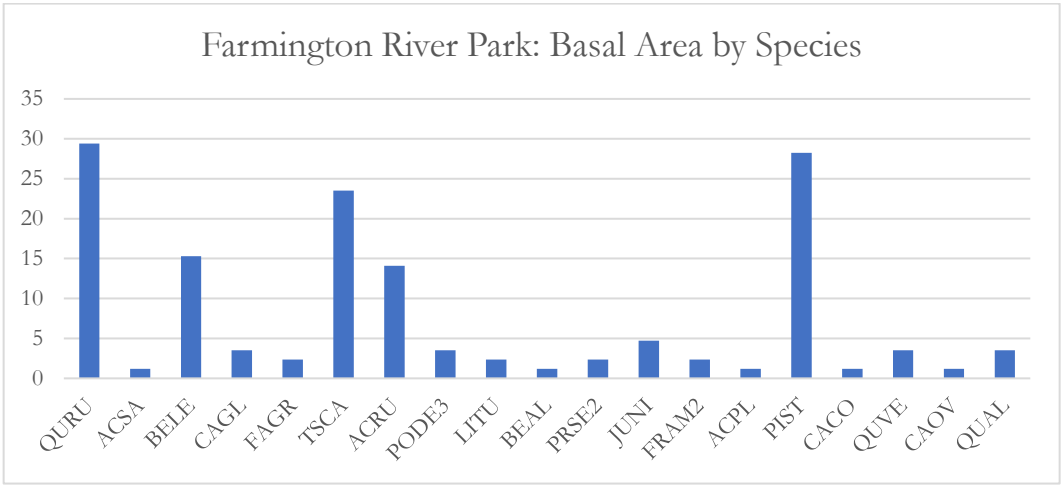
Species composition is led by:

- Red oak (QURU) – top contributor in basal area
- Eastern hemlock (TSCA) and sugar maple (ACSA) – structurally dominant in areas with denser cover
- American beech (FAGR) – a strong basal area contributor, though likely impacted by bark disease
- White pine (PIST) and cottonwood (PODE3) – dominant near wet zones or edges and old field sites

The regeneration cohort (<12") shows an abundance of cottonwood, beech, and hemlock, while trees ≥12" reflect more mature oaks, maples, and pines.



103	Trees/Ac
35	Saw TPA
68	Pole TPA
159	Total BA
114	Saw BA
45	Pole BA
11.9	QMD



Primary Soils: Windsor loamy sand (36C, 8–15% slopes)

- Characteristics: Excessively drained, sandy loam with rapid permeability, making it prone to drought.
- Topography/Terrain: Found on steeply sloping outwash plains and terraces.
- Typical Tree Species: Pitch pine, white pine, red oak, and black cherry.
- Use and Management: Best used for forestry, as agriculture is limited due to drought-prone conditions. Soil erosion control is necessary on steeper slopes.

Forest Health – Invasives & Pathogens

Invasives are moderate to severe, especially along disturbed rights-of-way such as the gas pipeline corridor and parking lot edges. Common invaders include:

- Oriental bittersweet – choking stems and climbing into canopies
- Multiflora rose and barberry – dense thorny shrubs dominating lower edges
- Burning bush – invading midstory in drier transition zones
- Hemlock Wooley Adelgid was notably present throughout the site

Invasive impact decreases within the dense interior forest, particularly in hemlock-dominated stands where shade suppresses colonization. However, open canopy areas, especially near infrastructure and mow lines, are highly vulnerable to further spread if untreated.

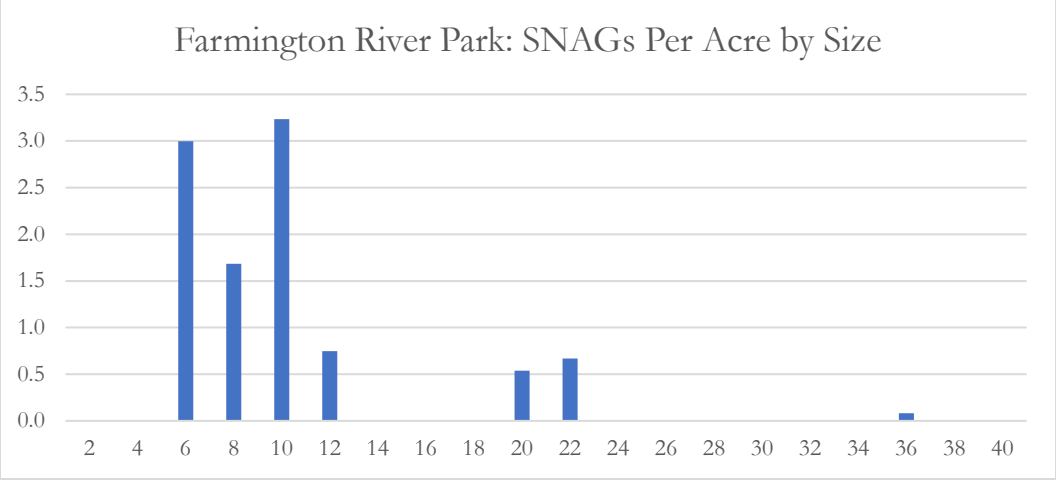
Beech bark and leaf disease is present. Given the strong basal area and age class of American beech (FAGR), monitoring will be required to track crown dieback and potential regeneration failure. Drought-prone sandy soils (Merrimac and Windsor series) may also increase stress on shallow-rooted or diseased individuals.

The slight presence of Norway maple (ACPL) indicates a potential threat of this non-native species eventually outcompeting native species. Active management, such as selective thinning, will promote the growth of native canopy species.

Wildlife Habitat

The forest's structural complexity supports diverse wildlife. Snags are present in a range of diameter classes, especially in the 6 – 12" and 20 – 22" ranges, providing cavity nesting and insect foraging habitat. Coarse woody debris, particularly near the river and mature pine stands, adds to the site's ecological value.

The wetland pockets adjacent to the Farmington River support hydrophytic tree species such as cottonwood and red maple, offering amphibian and waterfowl foraging habitat. Larger oaks and pines contribute mast and cover, while utility corridor and forest gaps offer support to early successional or edge-adapted species.



Boundaries and Encroachment

Encroachment issues are present but relatively contained:

- Suspected hunting activity (tree stands, bait piles) near remote edges
- Yard-waste dumping and debris observed near the pipeline and parking lot
- Solar panels and cleared infrastructure increase edge and access impacts

These disturbances threaten regeneration, facilitate invasive spread, and raise public safety or land use concerns. Coordination with adjacent landowners and public users is needed to clarify permitted uses and discourage boundary violations. That said, reducing the deer population in the area is a benefit to forest health and oak regeneration.

Recreation Possibilities

The park includes:

- A public parking area
- Maintained trail network
- Benches and picnic area
- Interpretive signage

Opportunities include:

- Expanding interpretive trails through interior
- Installing educational signage on invasive species, site history, and habitat features

Caution is needed to avoid overdeveloping or encouraging recreation in sensitive wetland or erosion-prone areas.

Management Recommendations

Immediate Priorities:

- Targeted invasive removal at pipeline, parking lot edges, and entrance to park
- Protect mature canopy trees by removing vines
- Engage landowners and local stakeholders to:
    - Clarify acceptable use
    - Discourage yard-waste dumping

Short-Term Goals:

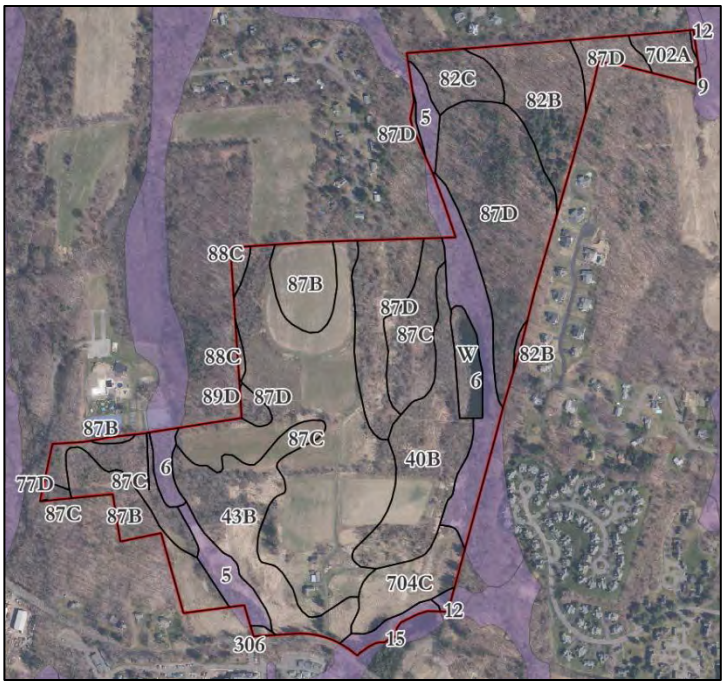
- Initiate regeneration monitoring, focusing on oak recruitment
- Monitor hemlock health, woolly adelgid is abundant in park
- Install interpretive signage along trails

Long-Term Goals:

- Develop a rotational invasive control plan
- Restore riparian edges with native shrubs and hardwoods adapted to fluctuating moisture
- Maintain the core forest for low-impact use, emphasizing climate-resilient and wildlife-compatible management
- Selectively thin by girdling to favor more drought tolerant species
- Develop or enhance a Friends of Farmington River Park group to lead and coordinate management efforts with town support

Farmington River Park is a high-potential, multi-use forest with a strong ecological foundation and significant structural diversity. While invasives and edge encroachment are emerging concerns, the mature forest interior remains resilient. A focused effort on managing edges, promoting native regeneration, and engaging surrounding stakeholders will ensure the long-term health and accessibility of this important public space.

LaSalette Park – 139 Acres



Address and Lat/Long

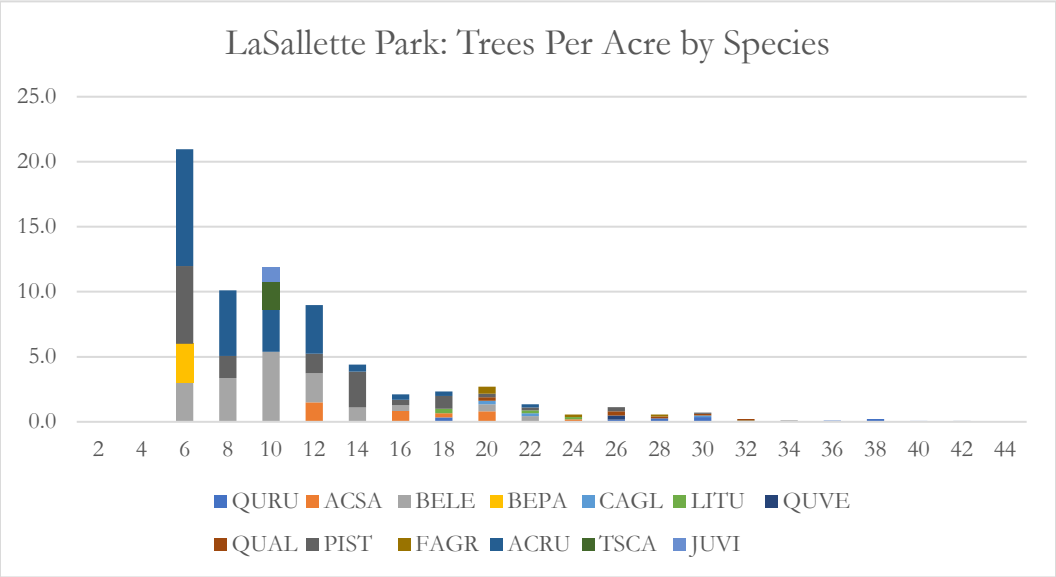
- 100-128 Mountain Ave, Bloomfield, CT
- 41°50'04.9"N 72°45'43.5"W

Forest Summary

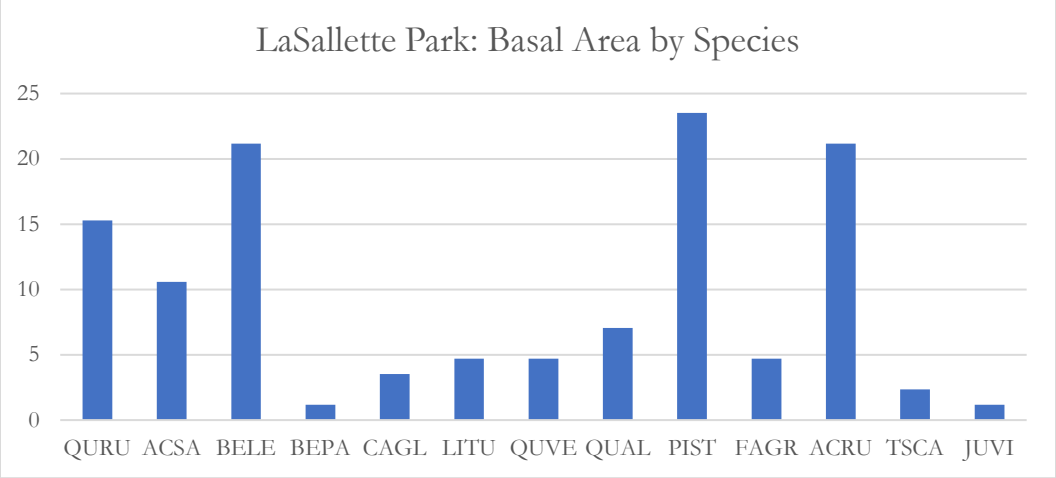
LaSalette Park is a large, multi-habitat property with a complex structure reflecting a mosaic of early successional/old fields, maturing pine-hardwood stands, regenerating hardwoods, and wetland pockets. The stand averages 84 trees per acre, comprising 29 sawtimber TPA (≥12") and 55 pole TPA (<12"), with a total basal area of 136 ft²/acre – mostly sawtimber (101 ft²/acre). The QMD of 12.1 inches suggests a forest in transition, with both mature and regenerating elements.

The canopy is a mix of red oak, white oak, black birch, red maple, and eastern white pine, with sugar maple, hickory, and cherry appearing in specific patches. The basal area charts indicate a fairly even distribution between oak, pine, birch, and red maple which suggests a transitional hardwood forest with variable moisture regimes and land use history. The regeneration (<12") cohort is dominated by red maple, black birch, and white pine. Sawtimber-sized trees show a balanced mix of hardwoods and conifers, indicating a structurally diverse forest.

Topographically, LaSalette spans upland terraces and wetland depressions. Lower areas with poorly drained soils support red maple swamps and speckled alder thickets, while upland slopes feature larger oak, cherry, and pine.



84	Trees/Ac
29	Saw TPA
55	Pole TPA
136	Total BA
101	Saw BA
35	Pole BA
12.1	QMD



Primary Soils: Wethersfield loam in three slope classes (87B, 87C, 87D 3-25% slopes)

- These soils are well-drained, moderately permeable, and fertile, favoring oak-hickory-maple forests.
- Steeper areas (87D) are prone to erosion, limiting agricultural use but ideal for forestry.
- The rolling terrain and varied slope create natural microsite diversity, supporting species variation and successional complexity.

Forest Health – Invasives & Pathogens

Forest health at LaSalette is heavily stratified by landform and disturbance history. Interior forest blocks, such as those dominated by oak and black birch with dense canopy closure, are largely intact but show stagnant regeneration, likely due to high deer pressure and competition from invasive shrub layers.

- Bittersweet and multiflora rose dominate field edges and canopy gaps.
- Autumn olive and Japanese barberry are spreading aggressively, particularly around old fields and early successional zones.
- Emerald ash borer has caused near-total loss of canopy ash across wetland zones.
- Beech bark disease and beech leaf disease are present in multiple plots, affecting both mature and regenerating beech.
- Woolly adelgid noted on understory hemlock saplings.

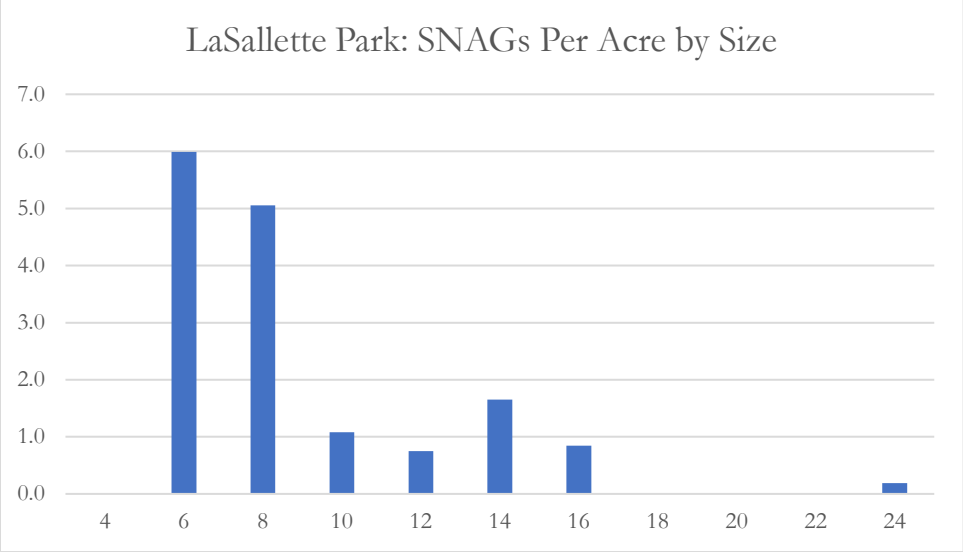
Wetland areas, once dominated by ash, have transitioned into dense thickets of multiflora rose, bittersweet, and barberry, with minimal native regeneration. Speckled alder and red maple are still attempting to recolonize, but many sites struggle to establish due to shading, browse, and invasive ground cover. These gaps, combined with historical disturbance and edge effects, have allowed invasives to outcompete native hardwood seedlings.

Wildlife Habitat

LaSalette Park still offers substantial habitat value due to its size and diverse patchwork of wetland, upland, and edge habitats. Snags are common, especially in the 6–10" DBH range, with combined counts exceeding 10 snags per acre in some wetland plots. These provide habitat for cavity nesters, woodpeckers, and insectivores.

- Edge-to-interior transitions include wetlands, field margins, and upland oak-pine stands.
- Snag presence supports cavity-nesting birds and small mammals.
- Wetland pockets with speckled alder and red-osier dogwood create valuable ground nesting habitat.
- Oak and hickory species provide mast, and the brushy, disturbed areas offer cover for edge-adapted species such as rabbits, foxes, and deer.

Despite the invasives, the mix of early successional thickets, open field edges, and mature canopy forest supports a range of birds, including blackbirds, blue jays, and other generalists. However, poor food quality from non-native fruiting plants may limit biodiversity benefits. With management, these habitats could support increased biodiversity, including early successional/grassland birds (e.g., towhees, chestnut-sided warblers, bobolink) and forest interior species (e.g., wood thrush) in less-invaded stands.



Boundaries and Encroachment

There are several indicators of boundary encroachment:

- Snowmobiling and ATV use across fields, often by adjacent residents.
- Brush and metal dumping near outer property lines, compromising aesthetics and habitat value.
- Lack of physical markers on field boundaries likely encourages informal recreational use.

Without clear boundaries and signage, unauthorized use may increase, leading to soil compaction, vegetation damage, and further spread of invasive species.

Recreation Possibilities

LaSalette Park includes a trail network, several open fields, significant historical features, and a community garden. Altogether, LaSalette provides great opportunities passive recreation, cultural significance, and nature access. However, invasives dominate many entry points, and dense thickets block views and walkability.

Recreation potential includes:

- Trail restoration with brush clearing, signage, and selective pruning
- Field-to-forest transitions as interpretive zones for successional ecology
- Historic interpretation areas featuring old farm tools and buildings with signage
- Wildlife viewing areas overlooking the red maple swamp or oak ridges

Some areas could benefit from reimagining as savanna-style parkland through pruning, mowing, and replanting—especially where natural regeneration is stagnant and invasive cover is manageable.

Management Recommendations

Immediate Priorities:

- Mechanically clear invasive thickets in field edges and heavy vine areas.
- Mark and sign boundaries to discourage unwanted use and dumping.
- Free young oak, hickory, and pine regeneration from vine entanglement.

Short-Term Goals:

- Create access corridors through dense invasives for volunteer crews and future management.
- Replant cleared areas using site-appropriate native hardwoods (e.g., red oak, red maple, white pine).
- Enhance the existing trail system through strategic improvements, such as stabilization of erosion-prone areas
- Installation of interpretive signage highlighting ecological and historical features.
- Install bird boxes in grassland areas. Many grassland birds, like American kestrels and bluebirds, prefer to nest in natural cavities.

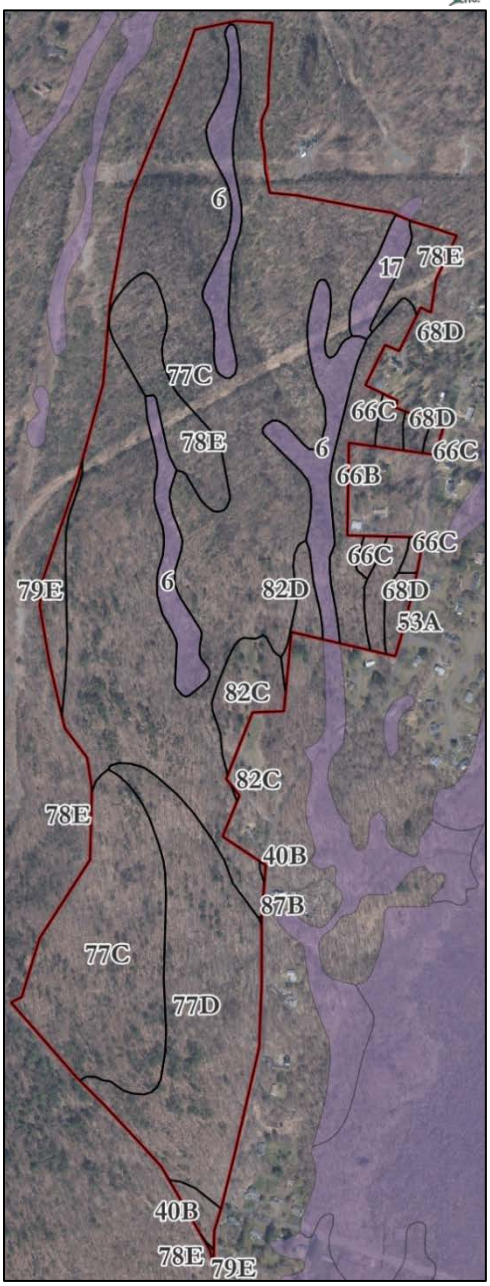
Long-Term Goals:

- Convert select old fields into diverse early successional habitat through mowing and seeding. Evaluate feasibility of livestock-based clearing (e.g., goats).
- Monitor forest health with attention to regeneration dynamics, vine return, and canopy closure.
- Develop a community stewardship initiative involving residents in cleanups, boundary watching, and invasive monitoring.

LaSalette Park is a highly dynamic forest with both tremendous ecological potential and serious management needs. While the core forest zones remain structurally sound, edge degradation, invasive spread, and regeneration stagnation threaten long-term forest function. With a combination of strategic clearing, targeted replanting, boundary management, and community engagement LaSalette can be guided toward a more resilient, ecologically diverse, and publicly valuable landscape. Sustained investment and a clear prioritization of effort – starting at the edges and progressing inward – will be key to its success.

Picture 4 Hartford skyline as viewed from the top of LaSallette Park

Wilcox Park – 221 Acres



Address and Lat/Long

- 46 Hoskins Rd, Bloomfield, CT
- 41°52'55.7"N 72°45'58.4"W

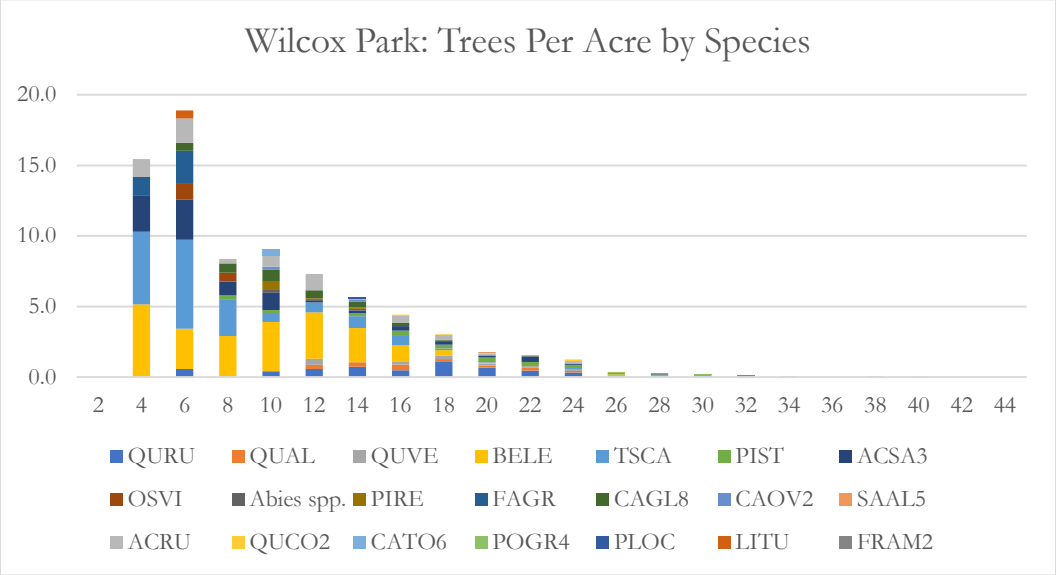
Forest Summary

Wilcox Park contains a diverse mosaic of upland oak-hemlock stands, red maple swamps, and historically disturbed mixed hardwood forests. The average trees per acre (TPA) is 90, with 31 sawtimber TPA and 59 pole TPA, suggesting a forest in transition between mid-successional structure and maturing canopy dominance. The basal area per acre is 124 ft², with sawtimber contributing 94 ft², indicating substantial canopy presence with scattered mature trees, including some large wolf trees in legacy pasture areas. A quadratic mean diameter (QMD) of 11.2 inches reflects this distribution.

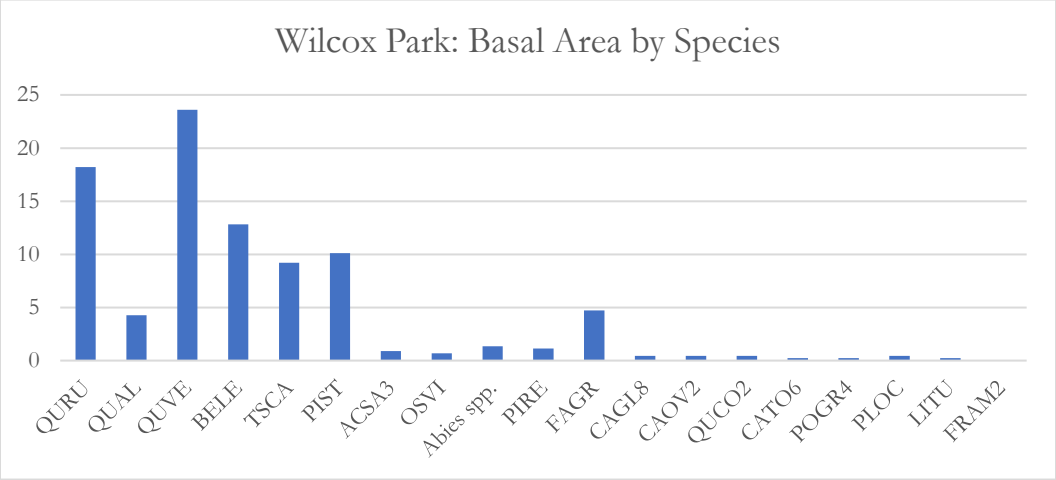
Canopy cover across plots ranges from open to fully closed (30–100%), largely influenced by slope position, windthrow, and deer browse. Topographic variation from trap rock ridges to wet valleys further shapes species composition and forest structure. Drier ridge-top sites support oak and hickory, while lower elevations host red maple, ash, and hemlock. Hemlock is widespread but shows signs of hemlock woolly adelgid, while emerald ash borer (EAB) has caused widespread ash mortality throughout the park. Beech leaf disease is also prevalent, impacting midstory beech in both upland and moist sites.

Species Composition

- Red oak (QURU) and black oak (QUVE) are the most significant contributors to basal area.
- Eastern hemlock (TSCA) and white pine (PIST) maintain strong canopy presence on upland soils.
- Red maple (ACRU) dominates in wetter areas and the regeneration layer.
- Other notable species include white oak (QUAL), sugar maple (ACSA3), and American beech (FAGR) in moderate amounts.
- Wet drainages show strong recruitment of alder, dogwood, and red viburnum.



90	Trees/Ac
31	Saw TPA
59	Pole TPA
124	Total BA
94	Saw BA
31	Pole BA
11.2	QMD



Primary Soils: Holyoke-Rock outcrop complex (78E, 15–45% slopes)

- Characteristics: Well-drained to excessively drained, shallow loamy soils over bedrock with moderate permeability.
- Topography/Terrain: Found on steep slopes and ridges, with significant rock exposure.
- Typical Tree Species: Chestnut oak, black birch, and red oak.
- Use and Management: Best left as woodland or conservation land. Development is highly restricted due to shallow depth and rock outcrops, making construction and agriculture impractical.

Forest Health – Invasives & Pathogens

Forest health at Wilcox Park is under pressure from both biotic and abiotic stressors. Invasive shrubs such as, Japanese barberry, bittersweet, multiflora rose, and burning bush, are present across multiple forest types, particularly in lower slopes, field edges, and moist toe slopes. These species suppress regeneration and create barriers to both wildlife and human access.

- Ash decline has created canopy gaps rapidly colonized by bittersweet, multiflora rose, and mugwort.
- Power-line rights-of-way are acting as invasive corridors.
- Red maple stands are often uniform and vulnerable to windthrow or further structural simplification, especially if regeneration remains poor.

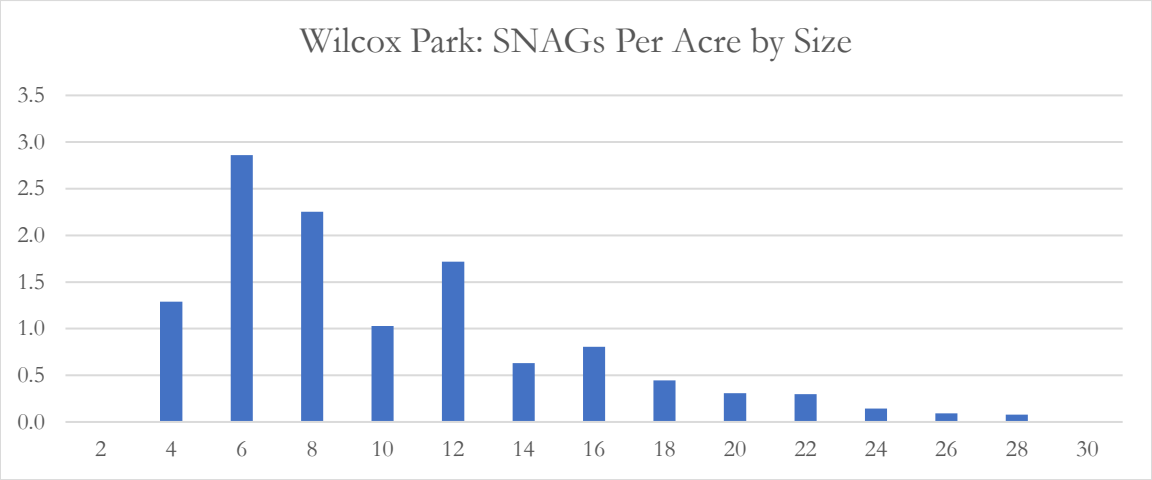
- Emerald ash borer (EAB) has caused extensive mortality of ash across swampy and upland sites, contributing to significant snag creation and woody debris buildup.
- Hemlock woolly adelgid (HWA) is widespread and has may be contributing to mortality in older hemlocks.
- Beech leaf disease is impacting both mature trees and regeneration, limiting the long-term viability of this otherwise shade-tolerant species.

Wildlife Habitat

Wilcox Park offers complex and dynamic wildlife habitat due to its range of successional stages, dead wood abundance, and topographic diversity. Snag density is notable, with size classes ranging from 4 to over 28 inches DBH. This provides excellent habitat for woodpeckers, cavity-nesting birds, bats, and small mammals. In many areas, snag presence is the result of ash mortality.

- Red maple swamps with native understory shrubs (alder, viburnum)
- Coarse woody debris (CWD) is prevalent, with numerous plots exceeding 50% ground cover.
- Large legacy oaks and mature birch provide mast and cavity opportunities
- The mosaic of open power-line corridors, pole-dominated stands, and wetter lowlands supports a range of species, from early successional birds to interior forest specialists

In wetter areas, these downed logs and branches create prime conditions for amphibians, reptiles, and fungal communities. Ridge-top and dry oak-hemlock stands offer mast-producing trees (e.g., red and white oak, hickory), supporting deer, turkey, and rodents. High structural diversity contributes to wildlife activity, including blackbird presence in canopy gaps and signs of bobcats and woodpeckers. While invasive thickets are generally ecologically negative, they currently offer low-nutrient cover for birds in degraded fields and edges.



Boundaries and Encroachment

Encroachment remains moderate but visible:

- Yard-waste dumping and debris piles are noted at residential edges, especially where access is easy or boundaries are vague.
- Some mowed encroachment may be occurring around the periphery, although limited in scope.
- Power-line areas could act as vectors for misuse if not clearly signed and stewarded.

Most forest interior boundaries remain mostly intact with high canopy closure and little sign of direct human disturbance.

Recreation Possibilities

Wilcox Park offers substantial recreational potential, though access and safety vary by location. Existing trails and informal walkways pass through high-quality interior forests, old pasture corridors, and scenic ridges. Future opportunities exist for:

- Scenic walking trails could highlight ecological topography of a trap rock ridge.
- A potential wildlife observation platform or boardwalk in the wetland area would draw interest while minimizing ecological impact.
- Educational signage on invasive management zones, habitat restoration efforts, or at former pasture plots with stone walls and legacy trees.
- Power-line corridors, while disturbed, could be used for interpretive early-successional habitat and restoration if managed properly.

Management Recommendations

Immediate Priorities:

- Remove invasive shrubs and vines at priority access points and forest edges—target bittersweet, multiflora rose, and barberry near trails and powerline edges. Mechanical removal paired with selective herbicide where appropriate.
- Flag and monitor snag trees to retain safe wildlife habitat while removing hazard trees where necessary.
- Begin marking young regeneration, especially oak and hickory.

Short-Term Goals:

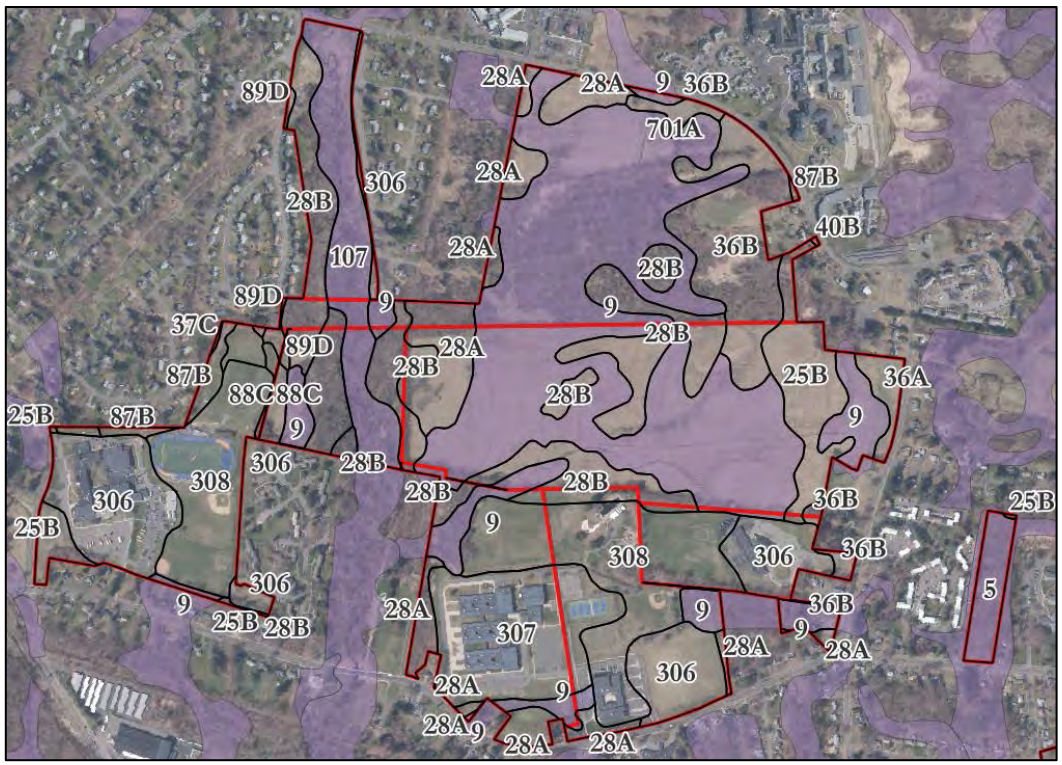
- Install boundary signage across the low slope
- Coordinate with neighbors or community groups for yard waste cleanups.
- Refresh trail blazes – mark and identify official trails, close out unauthorized trails

Long-Term Goals:

- Promote multi-age structure by thinning dense pole-maple sections and encouraging structural heterogeneity and encourage growth.
- Maintain and expand wildlife habitat complexity, retaining snags and downed wood in low-traffic areas.
- Evaluate potential for permanent conservation easement or expanded educational use in partnership with schools or conservation organizations.
- Explore options for restoring ash-dominated areas using native plantings if necessary.
- Consider getting a management plan for Wilcox Park – this park is large enough and entirely forested to warrant its own management plan.

Wilcox Park is an ecologically diverse and structurally rich public forest with strong conservation and passive recreation potential. While interior forest health is solid, its edges – particularly near power corridors and residential zones – require intervention to prevent further invasive spread and ecological degradation. Strategic management will allow degraded areas to recover, resilient regeneration to establish, and public access to be safely and meaningfully integrated. Active stewardship and community involvement will be critical to this transformation.

Samuel Wheeler Reed, Metacomet School, Park School Complex, and Highschool – 299 Acres



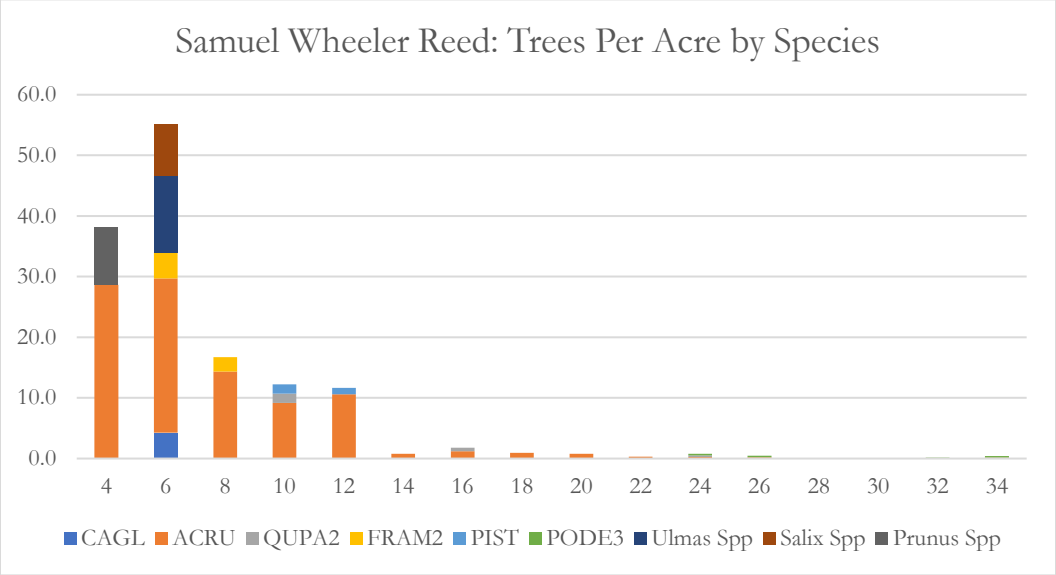
Address and Lat/Long

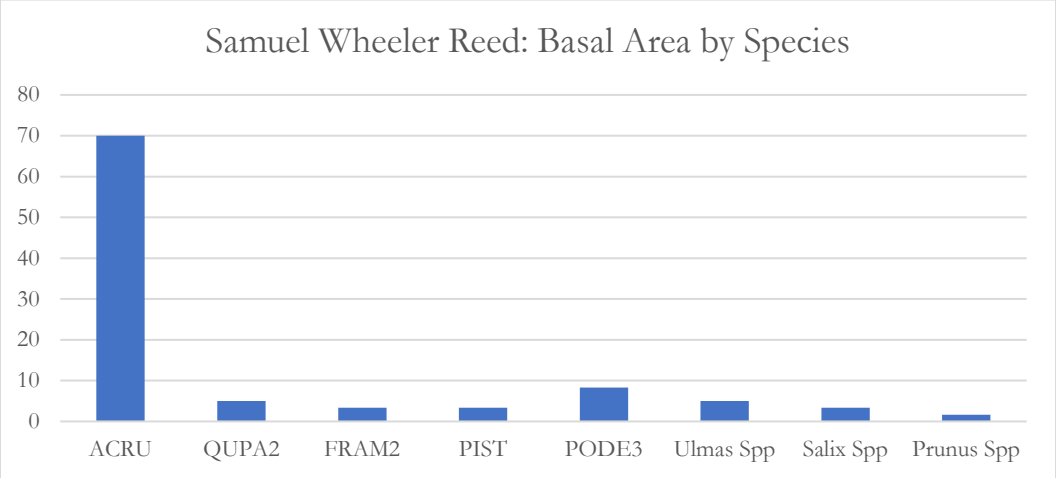
- 225 School St #171, Bloomfield, CT
- 41°49'40.7"N 72°42'25.1"W

Forest Summary

The forested patches across this 299-acre educational campus exhibit a variable canopy, predominantly composed of pole-sized red maple (ACRU) and green ash, with occasional cherries and other hardwoods. The forest structure reflects moderate density, with 145 trees per acre (TPA) and a total basal area of 110 ft²/acre, split between 55 ft²/acre in sawtimber and 55 ft²/acre in pole timber. This relatively balanced basal area across size classes and a quadratic mean diameter (QMD) of 8.3 inches suggests the stand is structurally immature, with most stems below commercial maturity but poised for recruitment into larger classes.

The dominance of red maple is evident in both basal area and tree count, indicating an opportunistic response to wet site conditions and overstory mortality (primarily from ash decline). Other species with minor representation include cottonwood (PIST), elm (Ulmas spp.), boxelder (CAGL), and willow (Salix spp.).





145	Trees/Ac
20	Saw TPA
125	Pole TPA
110	Total BA
55	Saw BA
55	Pole BA
8.3	QMD

Primary Soils: Scitico, Shaker, and Maybid soils (9, 0–3% slopes)

- Characteristics: Poorly drained, fine-textured, silty and clayey soils with very slow permeability.
- Topography/Terrain: Found in depressions and drainageways on lake plains, where water accumulation is common.
- Typical Tree Species: Red maple, eastern cottonwood, green ash, and swamp white oak.
- Use and Management: Best suited for wetland conservation or low-impact forestry. Poor drainage makes these soils unsuitable for row crop agriculture, and development requires significant drainage infrastructure.

Limerick and Lim soils (107, 0–3% slopes, frequently flooded)

- Characteristics: Very poorly drained, silty soil with slow permeability and high available water capacity.
- Topography/Terrain: Found in low-lying floodplain areas with frequent seasonal flooding.
- Typical Tree Species: Red maple, black willow, silver maple, and river birch.
- Use and Management: Best suited for wetland conservation, forestry, or limited grazing. Due to frequent flooding, development is not recommended.

Overstory gaps from emerald ash borer (EAB) mortality are creating light-filled patches, facilitating early successional growth but also increasing invasive species pressure.

Forest Health and Invasive Species

Emerald ash borer has heavily impacted ash populations, with many trees dead or in rapid decline. This mortality is leaving large canopy voids. Some snags remain, though many trees have already fallen and contributed to coarse woody debris (CWD).

Invasive species are abundant and widespread, with composition dependent on site conditions:

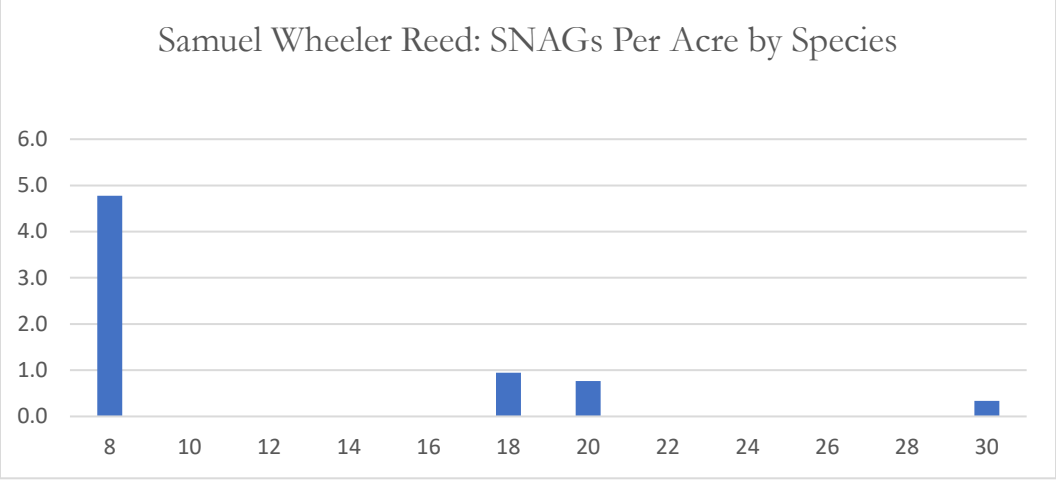
- Forest edges and mowed margins: Grape vine, bittersweet, and multiflora rose smother saplings and climb pole-sized trees, threatening regeneration.
- Disturbed drainageways and path margins: Japanese knotweed and phragmites pose a severe threat in wet, open soils, often outcompeting native wetland shrubs.
- Interior forest strips near neighborhood boundaries: Barberry and honeysuckle are common, likely spread by wildlife and residential dumping.

Management neglect at stand margins has allowed invasive populations to become entrenched, particularly where yard-waste dumping introduces soil disturbance and propagules.

Wildlife Habitat

- Despite invasive pressure, the stand provides moderate habitat value, particularly through:
- Snags of varying diameters (most in 8–12" range) that support cavity-nesting birds and small mammals.
- Coarse woody debris ranging from 10% to 40% cover, important for amphibians, reptiles, and detritivores. These CWD layers also contribute to soil moisture retention and seedbed diversity.

Vernal pools and red maple swamps offer potential breeding habitat for amphibians such as wood frogs and spotted salamanders. Areas with alder and dogwood may support nesting songbirds and browse opportunities for deer.



Boundaries and Encroachment

The site faces clear encroachment issues, particularly where school property abuts residential lots. Common concerns include:

- Yard-waste dumping, which disturbs soils, introduces invasives, and complicates management logistics.
- Unclear boundaries, with mowed areas and old fences creating ambiguity and allowing neighbors to claim use of school forestland.
- Derelict fencing, including barbed wire remnants, poses hazards for students, staff, and wildlife.

These encroachments both exacerbate forest degradation and hinder public engagement with the land as a managed natural resource.

Recreation Possibilities

The campus presents an opportunity for low-impact recreational and educational engagement:

- Trail loops or interpretive paths could highlight wetland ecology, tree identification, or forest health topics.
- Observation platforms near vernal pools or red maple swamps could serve as outdoor classrooms.
- Invasive species education can be integrated into science curricula or service learning through student-led removal projects.

Care will be needed to avoid trail placement in sensitive wet areas and to address erosion or invasive spread along paths.

Management Recommendations

Immediate Priorities:

- Invasive vine removal, targeting bittersweet and grape on red maples and cherries to preserve regeneration.
- Boundary clarification: Install signage or fencing to demarcate forested zones and discourage yard-waste dumping.
- Snag retention policy: Where safety permits, retain a portion of dead ash and other snags to enhance wildlife habitat.
- Hazard fencing removal: Take down old barbed wire and replace with visible but safe demarcation features.

Long-Term Goals:

- Use native species suited to wet soils (e.g., swamp white oak, pin oak, blackgum) to fill canopy gaps and outcompete invasives.
- Promote layered vertical structure by protecting mid-story saplings and managing overstory gaps.
- Establish a long-term rotational management plan to monitor and treat high-priority zones for invasive regrowth.
- Collaborate with school staff to design trails that integrate ecological interpretation while maintaining safe student access.
- Install bird boxes in grassland areas. Many grassland birds, like American kestrels and bluebirds, prefer to nest in natural cavities, but these are becoming scarce due to habitat loss and land management practices.

Property	Size (acres)	Forested Acres	Basal Area (sq. ft. /acre)	Trees Per Acre	Dominant Canopy	Understory Structure
Mary Hill Green	**1**	*N/A*	*N/A*	*N/A*	Sycamore, Oak, Arborvitae	Lawn And Planted Shrubs
West Eggleston Park	**1**	**1**	*N/A*	*N/A*	White Pine, White Oak, Red Maple	Cherry, Red Maple, Black Birch, Red Dogwood
Sinnot Farm	**2**	*N/A*	*N/A*	*N/A*	Oaks, White Pine, Aspen, Cherry, Tree Of Heaven	Sumac, Red Dogwood, Rubus Spp., Grasses
Pershing Park	**2.5**	*N/A*	*N/A*	*N/A*	Maple, Oaks, Sassafras,	Lawn
Town Hall Grounds	**6.75**	**1.5**	*N/A*	*N/A*	Oak, Maple, Sycamore, Beech, River Birch	Dogwood, Hemlock, Ash, Planted Shrubs, English Ivy
Lisa Lane Farm	**11**	**3.5**	*N/A*	*N/A*	Maple, Oaks, White Pine, Willow, Aspen, Hemlock, Hackberry	Witch Hazel, Beech, Cherry, Burning Bush
Essex Park	**12**	**1.5**	*N/A*	*N/A*	Maple, Oaks, Catalpa, Willow, White Pine, Aspen	Cherry, Dogwoods, Beech, Cattails, Hemlock
Maplewood Park	**12**	**4**	*N/A*	*N/A*	Maples, Oaks, Hickory, Sassafras	Musclewood, Spicebush, Red Dogwood, Ferns
Hubbard Park	**12**	**11**	**150**	**96**	Oaks, Cottonwood, Maples, Norway Maple	Black Locust, Beech, Maple,
Joyce Street Park	**14**	**14**	**130**	**118**	Oaks, Hickory, Maples, White Pine	Cherry, Beech, Maples, Burning Bush
Public Works	**18**	**5.5**	*N/A*	*N/A*	Oaks, White Pine, Cherry, Beech	White Pine, Sumac, Oak, Maple
Filley Park	**19**	**12.5**	**127**	**47**	Maple, Oaks, Hickory, Tulip Poplar, Beech	Maple, Beech, Black Birch, Cherry
Laurel School	**20**	**3.4**	*N/A*	*N/A*	Oak, Maple, Poplar, Willow	Red dogwood, Autumn olive, Rubus spp.
Board of Education	**22**	**6.5**	*N/A*	*N/A*	Oak, Maple, Pine, Tulip poplar, Willow	Dogwood, Speckled alder, Rubus spp, Red dogwood
Vista Gardens	**28**	**4.5**	*N/A*	*N/A*	Maples, Oaks, White Pine,	Red Dogwood, Speckled Alder, Winterberry Holly,
Rockwell Park	**33**	**31.5**	**92**	**124**	Maples, Oaks, Beech, Hickory	Musclewood, Red dogwood, Ash, Greenbrier
Farmington River Park	**90**	**90**	**159**	**103**	Oaks, Maple, Hemlock, White Pine, Beech, Cottonwood, Tulip Poplar	Cherry, Beech, Hemlock, Musclewood, Walnut
LaSalette Park	**139**	**77**	**136**	**84**	Oaks, Black Birch, White Pine, Tulip Poplar, Hickory, Maple	Eastern Hemlock, Hop Hornbeam, Beech, Juniper, Walnut,
Wilcox Park	**221**	**221**	**124**	**90**	Oaks, Black Birch, Eastern Hemlock, White Pine, Maples, Hickory, Beech	Hemlock, Beech, Oak Seedlings, Hophornbeam, Musclewood, Beech, White Pine, Witch Hazel,
Samuel Wheeler Reed and Schools	**299**	**124**	**110**	**145**	Red Maple, Ash, Cottonwood, Elm Spp., Willow, Oak	Speckled Alder, Spice Bush, Red Dogwood, Musclewood, Skunk Cabbage,

Table 1: Summary of Bloomfield Properties

FOREST HEALTH

Forest Health in these sites varies considerably depending on location, size, and current management practices. Larger forested parks often exhibit the most intact interiors, where older canopy trees, diverse understory vegetation, and relatively undisturbed soils support a healthier ecological balance. Smaller parks or heavily used forest edges, by contrast, tend to suffer greater disturbance: invasive vines fill in canopy gaps, and habitat quality is lower. Other parks that receive regular landscaping – such as manicured lawns and ornamental tree plantings – may keep invasive weeds in check around public areas but occasionally show poor planting techniques and maintenance damage to root systems or from pruning.

A key factor contributing to the poor forest conditions is forest fragmentation, where natural woodlands are divided by roads, development, or mowed fields into smaller, isolated patches. The resulting increase in forest edge exposes more boundaries to sunlight, disturbance, and human pressure, creating prime conditions for opportunistic invasive species to establish. When fragmentation occurs, wildlife corridors and the capacity of native trees to regenerate decline, while vines and shrubby invasive species spread more rapidly.

Invasive plants often outcompete native seedlings for critical resources – light, water, and soil nutrients – particularly along edges or in canopy gaps where sunlight is more abundant. Aggressive vines quickly girdle large canopy and mid-story vegetation, essentially cutting off their vascular system. Meanwhile, dense shrubs can form thick understories that prevent native tree seedlings from establishing. As a result, the next generation of native hardwoods struggles to establish itself, leading to a degraded forest structure with reduced biodiversity and fewer mature canopy trees in the long term. Without a healthy cohort of emerging trees, the site may permanently lose much of its large canopy trees, reducing native forest habitat and harming overall biodiversity. Over time, the structural complexity and services typically provided by a closed-canopy forest – such as wildlife habitat, soil stability, nutrient cycling, and recreation – are severely diminished or lost altogether.

Invasive Species

Invasive plants pose significant threats to local ecosystems and biodiversity. They often grow aggressively, outcompeting native species for sunlight, water, and nutrients, disrupting natural food webs and habitat structures. By overtaking native vegetation, invasive species reduce the habitat quality for wildlife, decrease the variety of plant life available, and ultimately diminish the overall resilience of the environment. Major invasive species identified across Bloomfield Parks include Autumn olive, bush honeysuckle, Asiatic bittersweet, Japanese knotweed, and tree of heaven (a more comprehensive guide to invasive species can be found in Appendix F). When left unchecked, these invasive plants will dominate the understory, create a vast seed bank, alter soil chemistry, degrade habitat (some are even harmful to wildlife), and damage and kill native canopy – locking native forests and wetlands into a simplified, less diverse state that is costly and labor-intensive to restore later.

Picture 5: LaSallette Park

Autumn olive is a fast-growing Asian shrub that tops out around 20 feet, with silvery-backed leaves and fragrant spring flowers, and then carpets itself with bright-red berries that birds spread far and wide. As a nitrogen fixer, it outperforms native plants on poor soils, forming dense thickets along roadsides, pastures, old fields, and any sunny, disturbed ground, thereby crowding out diverse shrub layers and altering soil chemistry. The quickest fix is early action: pull or dig seedlings and small plants when the ground is moist. For larger bushes, cut them to stumps and immediately apply herbicide to the fresh cuts, or use a basal-bark or girdling treatment and monitor for resprouts. Repeated mechanical removal alone tends to create tougher, multi-stemmed clones.

Bush honeysuckles, an assortment of Eurasian shrubs such as Amur, Morrow's, Tatarian, and hybrid Belle's honeysuckle, leaf out weeks before our natives, quickly grow to six-plus feet tall and form wall-to-wall thickets along forest edges, roadsides, fields, and disturbed woodlands. Their early shade smothers spring wildflowers, their dense canopies crowd out tree seedlings, and their showy blossoms lure pollinators away from native plants, leading to fewer native seeds. The easiest fix is to catch infestations early: hand-pull or dig scattered seedlings when the soil is moist and immediately tamp the soil. Where stands are thick, cut or burn shrubs to ground level twice a year for three to five years or pair that cutting with herbicides.

Asiatic Bittersweet is one of the most troublesome invasive species in our forests. Bittersweet can quickly overtake forest stands, smothering canopy trees and understory vegetation. Its girdling vines lower timber value and may grow much faster than many native tree sprouts, outcompeting them after disturbances. Bittersweet thrives along forest edges, where increased light availability and frequent disturbances encourage rapid growth. Over time, dense tangles of bittersweet can dominate forest edges, creating a barrier for both wildlife movement and the natural regeneration of native plants. In Connecticut's fragmented forests, where edges are abundant, bittersweet can quickly spread and dominate.

Japanese knotweed can reduce in-stream woody debris, lower habitat quality for wildlife, and potentially increase streambank erosion or flood risks when decaying plant material clogs waterways. Their vigorous rhizomes can also damage foundations, walls, pavement, and drainage systems, while dense growth along riparian zones restricts recreational access.

Tree-of-heaven is a fast-growing deciduous tree with prolific seed production, vigorous root suckering, and allelopathic chemicals that inhibit native vegetation. As a result, tree-of-heaven rapidly overtakes disturbed areas, reduces biodiversity, and is difficult to control without repeated targeted treatments. Tree-of-heaven is also the native host tree to the spotted lanternfly.

Norway maple is a shade-tolerant, deciduous tree that is becoming prevalent in the mid- and understory. It is known for its dense foliage, milky fluid in broken leaf stems, and adaptability to diverse soil and air conditions. It has become invasive in the United States due to its prolific wind-dispersed seeds, which establish readily and form a dense canopy that outcompetes native trees. Management involves removing seedlings by hand or girdling larger trees – creating SNAGs.

Pest And Pathogens

Across these sites, the most common and damaging pest and pathogen issues revolve around the emerald ash borer (EAB), hemlock woolly adelgid (HWA), and beech leaf diseases (BLD). Ash shows heavy mortality from EAB, with numerous dead or dying trees that open gaps for invasive vines. Hemlock woolly adelgid appears in several hemlock patches. Beech bark and beech leaf diseases are widespread anywhere beech forms a significant part of the canopy, causing many trees to decline or snap off prematurely. Black knot fungus frequently appears on cherries, while other incidental fungi or pathogens (e.g., minor willow fungus) occur on scattered individual trees. Where mature, healthy

oaks or pines still dominate, pest impacts tend to be less severe. Still, the general trend is a slow erosion of susceptible species (such as ash, hemlock, and beech) due to these persistent infestations and infections.

Emerald ash borer has affected several ash trees across the Town and has killed many. There is no practical solution to protect the remaining trees. Standing dead trees are critical for cavity-nesting birds, and the woody debris on the ground is used by ground-nesting animals. It is, however, advised to encourage the growth of any living seedlings and saplings. Emerald ash borer-affected trees can be identified by locating the D-shaped exit hole.

Picture 6: EAB exit hole on Ash tree at LaSallette

Hemlock Woolly Adelgid is a non-native, aphid-like insect that feeds on the sap of eastern and Carolina hemlocks, leading to tree decline and mortality. The insect reproduces rapidly, with two all-female generations per year, and forms woolly masses on the undersides of new growth. HWA feeds on the tree's storage cells, impairing new growth and often killing trees within a few years, a process exacerbated by additional stressors, such as the non-native elongate hemlock scale and the native hemlock borer. Biological control has been implemented statewide through the release of *Sasajiscymnus tsugae*, a predatory beetle native to Japan. Over 178,000 beetles have been released at 35 sites since 1995, with long-term monitoring ongoing to assess effectiveness. Despite past die-offs, many hemlocks are showing signs of recovery.

Beech leaf disease is the effect of a nematode species that grows inside the vegetative buds of American beech. When the new leaves emerge, they are significantly damaged, compromising their ability to photosynthesize. It can be identified by discolored banding between veins on leaves and an overall thinning of the canopy. Unfortunately, there is no remedy, and the long-term outlook for the American beech in New England is bleak. Forest land owners and managers should not expect American beech to be a significant component of their forests in the future.

Stream Health

Wash Brook and Beamans Brook are two tributaries of the North Branch Park River that run through sections of Bloomfield and intersect several properties under your management. Wash Brook originates north of Bloomfield Center and flows south through a mix of land uses before joining Beamans Brook near the Hartford border. Beamans Brook runs through Samuel Wheeler Park and the Bloomfield school complex, where storm surges have caused the stream to cut deeply into the soils, leading to active bank erosion. While the stream is bordered by riparian vegetation that helps stabilize the banks under normal conditions, high-flow events are undermining these

areas, creating canopy gaps that have allowed invasive species to establish and spread along the stream corridor. Wash Brook, which flows through Filley Park, faces similar challenges from stormwater runoff and urban pressures, though sections still retain healthy riparian buffers.

WILDLIFE HABITAT

Bloomfield's natural forested areas offer a refuge and a passageway for mammals moving through the neighborhood, including foxes, raccoons, mice, and others. Highly productive red and white oaks are an excellent food source for deer. White oaks, in particular, provide excellent habitats for native mammals and native pollinators such as moths.

These properties collectively offer a diverse patchwork of wildlife habitats. Wetlands and vernal pools support amphibians, while red maple swamps, riparian zones, and pockets of standing water attract waterfowl and other wetland species. Mature oaks, hickories, and conifers provide both canopy cover and potential cavity sites for birds, bats, and small mammals. Field–forest edges and shrubby corridors create foraging and nesting habitat for songbirds, particularly where mowing is minimal and understory growth persists. Deer are abundant, indicating sufficient browse and cover, though high deer pressure also limits native sapling recruitment.

Snags, dead-standing trees, in a forest are a critical component of wildlife habitat for about 35 species of birds in the Northeast and a variety of amphibians, reptiles, and mammals. From the Connecticut Department of Energy and Environmental Protection: "Insectivorous birds such as woodpeckers and nuthatches depend heavily on snags as a source of food. These birds, in addition to being an integral part of our natural ecosystem, are very beneficial in helping to control unwanted insect pests. The importance and benefits derived from insectivorous birds as biological control agents are receiving more attention."

DEEP recommends three snags of 12 inches in diameter or greater be present per acre, well distributed. At least one 15-inch snag (or larger) should be present per acre. The Connecticut Audubon Society recommends a minimum of 5 snags per acre greater than 10 inches in diameter and 4 cavity trees greater than 12 inches, of which 1 should be greater than 18 inches in diameter. In time, snags will naturally occur; however, snags can also be created by girdling live trees (cutting rings around the base with a chainsaw at least deep enough to sever the cambium).

Given the diverse canopy and structural complexity, migratory birds likely use these sites. To enhance this function, minimize disturbance during migration seasons and consider adding bird boxes or maintaining natural nesting sites. In less-trafficked areas, retain a mix of dense understory and open ground to create varied microhabitats for various bird species during breeding and migration seasons. Open spaces within urban and suburban landscapes are particularly important for migrating bird species to have refuges during migration seasons. The following birds were identified while conducting fieldwork: Red Winged Black Bird, Song Sparrow, Blue Jay, Connon Grackle, Red Bellied Woodpecker, Mourning Dove, Northern Cardinal, Song Sparrow, Black Capped Chickadee, White Throated Sparrow, Tufted Titmouse, White-Breasted Nuthatch, American Robin, Dark-Eyed Junco, Downy Woodpecker.

Property	+10"	+12"	+15"	+18"
CT DEEP		3	1	
AUDUBON	5	4		1
Hubbard Park	2.3	2.3	0	0
Joyce Street Park	3.9	1.6	0	0
Filley Park	2.5	2.5	2.5	1.7
Rockwell Park	0	0	1	0
Farmington River Park	5.3	2	1.3	1.3
LaSalette Park	0.7	0.7	0	0
Wilcox Park	5.6	4.6	2.2	1.4
Samuel Wheeler Reed and Schools	2	2	2	2

Table 2: Snags per acre by size class compared to CT DEEP and Audubon standards

Wetlands

Wetlands are ecologically dynamic systems where the presence of water near or at the soil surface significantly influences soil development, hydrology, and the composition of plant and animal communities. These habitats vary across the landscape in response to local and regional conditions, including soil type, topography, climate, hydrologic regime, and land-use history. Functionally, wetlands serve critical ecological roles, including slowing and filtering stormwater runoff, recharging groundwater, stabilizing streambanks, and supporting high levels of biological productivity and biodiversity.

In Connecticut, inland wetlands are delineated primarily based on soil characteristics under the Inland Wetlands and Watercourses Act. These include:

- **Poorly drained soils** – typically found on flat or gently sloping terrain where groundwater remains near the surface during part of the year.
- **Very poorly drained soils** – often saturated or inundated, especially in the spring and summer months.
- **Alluvial and floodplain soils** – associated with riverine systems, with drainage characteristics ranging from excessively drained sands to water-retentive silts and clays.

Forested wetlands, such as red maple swamps, are essential habitat for the Canada Warbler, offering dense shrub layers, low canopies, and structurally complex forest floors with hummocks, exposed root systems, and downed woody debris that conceals nests and fledglings. Shrub-dominated wetlands also provide valuable habitat for species like American Woodcock and Willow Flycatcher. Rocky streams within forested settings support Louisiana Waterthrush, which nests in cavities under steep streamside banks or fallen roots near water.

Picture 7 Skunk Cabbage Flower at Rockwell Park - Wetland Species

Vernal pools are isolated depressions that hold water in the spring and early summer but dry out later in the year. These pools lack permanent inlets or outlets and serve as essential breeding habitat for a suite of obligate amphibians and invertebrates such as wood frogs and salamanders. Due to their ephemeral nature and lack of fish predators, vernal pools support high reproductive success for these species. Vernal pools are ecologically fragile and particularly susceptible to disturbance from changes in adjacent land use. They are recognized and regulated by both state and federal environmental agencies for their conservation importance.

Wetlands are a significant component of the properties outlined in this plan, with wetland soils comprising 12.73% of the total land area. These soils are generally found in riparian corridors, low-lying swales, and floodplains, and they contribute significantly to habitat diversity and structural complexity across a forest. Their conservation should, therefore, be prioritized during forest management.

BOUNDARIES

Trash and encroachment are prevalent a long many of the boundary lines. The boundaries for these properties are not consistently marked with painted blazes or signs. We recommend that boundaries be walked and signage refreshed, if necessary, every five years.

RECREATION

Many of these properties offer a surprising amount of variety and scenic appeal for recreation. Open fields can be used for low-impact activities such as birdwatching, nature walks, or informal sports. Interspersed throughout are forest edges, wetland pockets, and vernal pools, all of which create diverse habitats that particularly appeal to birders and hikers. Many sites feature mature canopy trees that add character to the landscape, along with field edges that, when managed well, can serve as relaxing green spaces or nature corridors near residential areas. In a few spots, old roads or mowing paths already exist, hinting at the potential for simple trail systems that could be developed or maintained for local walking or environmental education.

At the same time, a lack of cohesive signage or infrastructure undercuts the recreational potential. Several sites lack basic amenities such as clear trail markers, benches, parking areas, or trash cans. Where recreation does occur, much of it seems informal and unstructured. Park infrastructure might include signs or a few picnic tables, but typically, there are no interpretive signs or other features that would invite deeper exploration or help visitors understand the ecological value of each space - save for a handful of locations. Locked gates, unmarked property lines, and dumping at edges might further discourage people from seeing these areas as welcoming public spaces.

Significant problems with invasive vegetation – especially multiflora rose, bittersweet vines, and honeysuckle – also compromise the recreational experience. At several sites, forest edges and canopy gaps are overrun with invasive species and debris, making it nearly impossible for visitors to perceive them as safe or attractive places to explore. Encroachment from neighbors, combined with yard-waste dumping, likewise creates eyesores near property boundaries. These degraded zones can quickly reduce foot traffic and deter people from coming back.

Yet, the overall picture is one of significant potential. If given regular stewardship – such as modest invasive removal, mulching, clearing debris, improving trails, and placing appropriate signage – these natural areas could provide everyday outdoor recreation for local communities. Birding hotspots are already there for the enthusiastic observer, and wetlands or forest stands have the complexity to support nature study programs. With more intentional boundary marking, improved mowing strategies in open fields, and basic trail maintenance, each property could become more accessible and user-friendly. By investing in a coherent vision for these parks, schools, and open spaces, the positive aspects – ranging from wildlife habitat to scenic walking – would come into clearer focus, making them far more rewarding for public recreation.

Picture 8 Filley Park

RECOMMENDATIONS

Green infrastructure is especially important in urban areas, improving air quality, moderating temperatures, and providing outdoor learning and recreational opportunities that enhance the overall well-being of residents. Engaging support from local schools, universities, and park stewardship organizations remains vital to the success of these forest restoration projects. Such groups provide valuable volunteer labor and specialized expertise, fostering long-term community investment in the land.

This document is intended to guide your team in stewarding Bloomfield's public parks and natural areas over the next decade. While the accompanying table outlines our recommendations by priority and timing, each site is different – and so are your goals. Due to the locations and sizes of the properties, large-scale forest management operations are likely to be unfeasible or undesirable. Flexibility and adapting to changing conditions support planning, budgeting, and on-the-ground implementation. Therefore, the following recommendations are intended to achieve stated goals with care and balance for as many features and factors as possible. Before diving into specific tasks, we recommend organizing your management efforts around the following principles:

- **Protect what's working:** Preserve healthy canopy areas and intact forest interiors through low-impact monitoring and early detection of threats.
- **Start with visibility and access:** Highly trafficked and easily accessible sites should be prioritized for aesthetic improvements and community visibility.
- **Control what spreads:** Invasive species, unmanaged edges, and dumping corridors are the greatest threats to long-term forest function.
- **Restore strategically:** New plantings and habitat improvements should follow invasive removal and boundary definition.
- **Engage and educate:** Trails, signage, and volunteer days build public investment in long-term stewardship.

High Priority Actions (Years 1–3)

These are "high-return" tasks – actions that either prevent more expensive issues down the line or immediately improve public experience. We recommend focusing on:

- **Visible improvements**: Remove hazard trees, clean up dumping sites, prune high-risk limbs, and protect young plantings with mulch and deer guards.
- **Invasive species triage**: Start mechanical or chemical control of the most aggressive invasives (e.g., bittersweet, knotweed, multiflora rose) in areas where public access and sunlight encourage growth.
- **Clarify Park boundaries**: Install signage, repair fences, and mark forested boundaries in areas with known encroachment. These simple steps protect your investment in restoration and deter future misuse.
- **Pilot projects**: Use one or two high-traffic parks as demonstration sites to prioritize community management. Install interpretive signage, pollinator gardens, or educational trails.

Mid-Term Projects (Years 3–6)

Once baseline protection and cleanup are underway, begin building infrastructure that supports long-term forest resilience and passive recreation.

- **Replant gaps**: Focus on native hardwoods and site-appropriate trees to replace ash loss, support pollinators, and buffer disturbed areas.
- **Trail development**: Install low-impact trail loops in parks with interior forests. Prioritize sites with dry soils and mature canopy for minimal disturbance. Install boardwalks in wetter areas.

- **Create site-specific goals**: Set specific objectives per park – e.g., restoring a meadow, maintaining a successional field, or developing educational partnerships with local schools.
- **Maintain momentum**: Revisit invasive sites on a seasonal or annual basis – repeat treatments are often required for full suppression.

Long-Term Investments (Years 6–10)

These are the actions that secure long-term ecological value and create lasting public benefit.

- **Successional support**: Selective thinning to encouraging oak and hickory regeneration, and diversifying mid-story structure will strengthen forest resilience.
- **Expand interpretation**: Add educational signage on soils, forest types, or wildlife use. Use trails and restored areas to tell the story of your management journey.
- **Landscape-scale vision**: Identify core forest patches or wetland buffers that could be prioritized for permanent conservation or stewarded as natural preserves.
- **Formalize stewardship**: Consider a town-wide urban forestry strategy or forest management plan that codifies ongoing monitoring, funding needs, and community engagement.

General Summary of Recommendations	
Property	**Recommendations**
Mary Hill Green	• Introduce pollinator gardens to add ecological value • Consider planting native understory ornamentals (e.g., redbud, dogwood)
West Eggleston Park	• Regularly monitor edges for invasive expansion • Provide trash receptacles or compost stations near entrances • Plant ornamentals near benches/sidewalks
Sinnot Farm	• Target tree-of-heaven with herbicide or removal protocols • Regularly inspect and remove invasives around forest edge • Add educational signage and trash receptacles to discouraging waste dumping
Pershing Park	• Remove or prune hazardous trees near power lines • Consolidate or remove the double fence • Develop a planting strategy to maintain park canopy cover
Town Hall Grounds	• Training for maintenance crews on correct planting depth and mulching • Monitor edges for invasive incursion • Install loop trail with interpretive signage
Lisa Lane Farm	• Organize a community event to remove trash and control invasive species. • Mark property boundaries
Essex Park	• Remove outdated fencing • Target invasive plants on forest edges • Plant shade trees to develop park setting
Maplewood Park	• Focus on edge management of invasive shrubs • Organize a community event to remove trash and control invasive species. • Mark property boundaries • Plant native buffers to stabilize wet/erosion-prone soils
Hubbard Park	• Remove dumped materials and conduct visual boundary cleanup • Begin invasive removal and targeted native planting • Mark property boundaries • Develop trail network and preserve other parcels

Joyce Street Park	• Organize a community event to remove trash and control invasive species. • Invasive control targeting burning bush, bittersweet, honeysuckle, etc. • Mark property boundaries • Install trail loop with educational signage
Public Works	• Install mulch rings and deer guards • Remove/prune encroaching vines or rose • Retain vernal pools
Filley Park	• Invasive removal at cemetery edges, culverts, grocery fence • Correct improper tree plantings • Plant native hardwoods and monitor tree health
Laurel School	• Stabilize slopes with deep-rooted native shrubs • Repair fences and discourage dumping • Target vines on slopes
Board of Education	• Clean dump sites and remove large debris • Monitor and lightly manage natural regeneration • Control vines and invasives at fence lines
Vista Gardens	• Remove or cut back invasive vines near edges and open grown trees • Mark property boundaries • Investigate grassland restoration projects
Rockwell Park	• Reforest canopy gaps with native plantings • Organize a community event to remove trash and control invasive species. • Target bittersweet on forest edges • Mark property boundaries • Create forest classroom between to school and library
Farmington River Park	• Organize a community event to remove trash and control invasive species. • Protect canopy trees from vines • Engage stakeholders to clarify use and discourage dumping • Inventory snags and monitor regeneration • Mark property boundaries
LaSalette Park	• Organize a community event to remove trash and control invasive species. • Free regeneration from vines • Implement rotational invasive control and replant gaps • Mark property boundaries • Investigate grassland restoration projects
Wilcox Park	• Organize a community event to remove trash and control invasive species. • Monitor snags and flag for habitat vs. hazard • Install educational signage • Promote multi-age structure with selective thinning • Mark property boundaries
Samuel Wheeler Reed and Schools	• Organize a community event to remove trash and control invasive species. • Mark property boundaries and remove old fencing • Plant native wet-tolerant species to restore canopy gaps • Create educational trails and signage • Investigate grassland restoration projects

Table 3: Summary of Recommendations across all properties

Forest Health

A legacy of intensive forest management and aggressive introduction of invasive species has created a landscape-wide problem for most forested properties, requiring ongoing forest management now and into the future. These parcels offer an interesting opportunity to allow natural regeneration, so long as 1) the canopy remains vigorous over time, 2) the invasive species are managed in the understory so that the canopy can regenerate when there is a natural disturbance, and 3) natural disturbances occur. If 10 or so years pass without a natural disturbance and the canopy becomes severely overcrowded, the health of the trees can begin to suffer, and more hands-on management will become necessary. Connwood Foresters recommends that the canopy in these properties be left as is to develop over the next ten years, while invasive-species management and restoration projects are undertaken. This approach allows the canopy to naturally regenerate in the event of a natural disturbance.

We recommend that several invasive treatments be carried out to address the invasive and recalcitrant species on the properties. First, focus on Asiatic bittersweet due to its aggressive nature and the damage it causes to canopy trees. The following is a step-by-step guide to managing and removing invasive vines. Each step emphasizes the preservation of the future forest canopy, focusing on high-value mature trees, utilizing low-disturbance removal methods, and planning for ongoing follow-up. By targeting edges, working in winter when possible, and differentiating between harmful invasives and beneficial native vines, these best practices help reduce the spread of invasive species while safeguarding existing and future forest structure. This work can be best accomplished through community engagement and the involvement of volunteers.

1. **Protect the Future Canopy First:** Identify and flag (e.g., with pink ribbon) beneficial native saplings and shrubs so they are not accidentally cut or pulled. This helps ensure you retain the young plants that will become the next generation of canopy trees and valuable native understory.
2. **Focus Efforts on Existing Canopy:** Focus on mature, high-value trees and remove any bittersweet vines choking or climbing them. Vines cause structural damage by adding weight, creating a "sail effect," and girdling branches. Removing them where they harm the canopy does the most immediate good.
3. **Use a "Clip High, Clip Low" Method:** Cut vines near the ground and again about shoulder height. This creates a "window" so the vine can't reconnect easily, or act as a ladder. Leave the dead vine in the canopy rather than pulling it down to avoid damaging tree branches.
4. **Repeat Follow-Up Cuts:** Bittersweet resprouts vigorously from its root system, so cutting once is rarely enough. Revisit the site multiple times in the same season – especially in spring and mid-summer – to cut off new growth and further deplete the vine's energy reserves.
5. **Target Edges and Ladder Fuels:** Bittersweet thrives at forest edges where more light, water, and nutrients are available. Also remove any "ladder" shrubs or saplings that vines use to climb into the canopy (green briar, multiflora rose, burning bush). Keeping forest edges and understory clear of invasive vines helps protect the interior forest.
6. **Work in Winter (When Possible):** With leaves off, it's easier to see and identify vines, and you minimize disturbance to nesting birds. You also avoid heavy tick activity and can wear protective clothing for thorny plants more comfortably.
7. **Be Selective About Which Vines You Remove:** Tag or learn to identify beneficial native vines (like Virginia creeper) and avoid cutting them. Focus on known problem vines such as Asiatic bittersweet, multiflora rose, porcelain berry, and invasive honeysuckles.
8. **Use Low-Energy, Low-Disturbance Techniques:** Simply clipping and leaving cut vines on the ground helps maintain soil structure and minimizes erosion. Pulling out roots can disrupt the soil, encourage more sprouting, and damage nearby native plants.

9. **Engage Community Volunteers:** Removing invasive vines is labor-intensive but can be done with simple tools (loppers, hand saws, etc.). Training local groups or volunteers creates a sense of stewardship, expands the workforce, and provides ongoing monitoring and maintenance.
10. **Persistence is Key:** One-time clearing rarely solves an invasive infestation. Regular, repeated management – ideally coordinated across the whole site – prevents vines from reclaiming newly cleared areas and keeps mature trees healthy over the long term.

Japanese knotweed and mugwort can be very difficult to eradicate once established in a forest setting, so continued removal and monitoring are a good first step. Smothering is an herbicide-free technique to control knotweed that involves cutting the stems, covering them with mulch, and then placing a sturdy tarp or plastic over the entire infested area for several years. This process weakens the root system by preventing sunlight from reaching any new shoots and depriving the plants of the energy they need to survive. Mowing knotweed is not recommended as it can promote the spread of knotweed by distributing vegetative propagules.

1. **Initial Growth:** Let the knotweed grow in spring without disturbance.
2. **Cutting:** Around early June, cut the knotweed at its base to weaken its root system.
3. **Drying the Stems:** Place the cut stems on a surface (like a tarp or pavement) to dry out – preventing reestablishment from cut stems.
4. **Cushion Layer:** Lay mulch, grass clippings, or other protective material over the sharp, cut stems to prevent them from puncturing the tarp/plastic.
5. **Cover Thoroughly:** Use a heavy-duty, dark-colored tarp or plastic (at least 7 mils thick) to cover the entire area, extending 5–10 feet beyond the knotweed's perimeter. Overlap any seams by about 2 feet.
6. **Secure the Cover:** Weigh down and seal all edges without puncturing the tarp. Check for holes and patch them if needed. Covering with mulch or wood chips on top of the tarp improves appearance, blocks UV light, and adds insulation.
7. **Long-Term Commitment:** Leave the covering in place for about 5 years, then remove it and replant the area once knotweed is no longer present.

The smothering technique is applicable for mugwart as well. However, if cutting is the preferred management, mowing from early summer until mid-September helps prevent seed formation and dispersal, with the first two weeks of September being ideal. If cut before seeds mature, the cut seeds will not produce new plants. However, mowing after seeds have matured risks spreading viable seed, so any cuttings after mid-September should be collected and bagged.

Wildlife Habitat

Connecticut's forests provide a critical breeding habitat for more than 175 species of birds. Many of these species are in decline due to habitat loss, especially those that rely on structurally complex forests or early successional habitats. Bird habitat quality can be enhanced with management by promoting layered vegetation, such as dense understory and midstory growth, which provides cover, nesting sites, and foraging opportunities. Many priority bird species rely on live woody vegetation between 0 and 30 feet tall, as well as leaf litter, snags, and coarse woody debris for nesting or feeding. Retaining or creating cavity trees and snags—especially large-diameter or decaying ones—is valuable for woodpeckers, owls, and other secondary cavity-nesters. Oaks, birch, cherry, and native shrubs like blueberry and spicebush are important for birds, as they support a rich supply of caterpillars and soft mast, which serve as vital food sources during the breeding season.

Deer browse poses a significant barrier to forest regeneration and habitat quality across all sites. High deer densities can suppress understory development and shift species composition, negatively affecting birds that nest or forage

near the ground. To encourage healthy regeneration, it may be necessary to incorporate fencing, increased slash retention, or other deterrents when conducting management. Additionally, the time of year for management operations matters—avoiding the breeding season (mid-April to late August) can prevent disruption to nesting birds.

Incorporating brush-pile construction into invasive removal offers an efficient and cost-effective disposal method that simultaneously enhances habitat quality. When stacked in discrete, well-marked locations away from main visitor corridors and planting zones, these piles provide immediate shelter and overwintering sites for small mammals, ground-nesting birds, herpetofauna, and beneficial insects. Over time, the decaying woody material enriches the soil's organic matter and moderates moisture levels, thereby improving establishment conditions for newly planted native vegetation. For more information on constructing brush piles, see Appendix E.

Abrupt forest edges—areas where forest transitions to non-forest habitats like fields, roads, or development—can negatively impact forest-interior bird species. These edge zones increase the risk of nest predation by raccoons, cats, and skunks, and also facilitate brood parasitism by Brown-headed Cowbirds, both of which reduce the nesting success of many forest birds. These edge effects are particularly strong in fragmented landscapes and can extend over 300 feet into the forest from the edge.

Mitigate this effect by "softening" or "feathering" hard edges. Creating gradual transitions between forest and open areas using shrubs and smaller trees – obscuring visibility and reducing access for predators and parasitic species. This not only protects forest-interior species but also creates additional habitat for shrubland and edge-dwelling birds. Softening can be achieved by planting native shrubs and small trees, allowing natural regeneration at forest margins, or using selective thinning and brush management to shape the transition zone.

Features That Benefit Birds

- Dense understory & midstory: Provide nesting and foraging cover.
- Snags & cavity trees: Crucial for nesting and insect foraging.
- Coarse woody debris: Supports insects and cover;
- Leaf litter: Vital for ground nesters like Ovenbird and Veery.
- Tree species diversity: Oaks, birch, cherry, and native shrubs provide caterpillars and mast.

Riparian Restoration

Riparian areas – streams, ponds, and wetlands within or adjacent to forested landscapes—provide essential breeding and foraging habitat for several of Connecticut's priority bird species. Riparian restoration can be effectively initiated using live cuttings from nearby willow trees already present on-site or in the vicinity. Willows root readily from dormant cuttings and are well-suited for stabilizing streambanks due to their fast growth, deep root systems, and tolerance for saturated soils. By harvesting healthy, pencil-thick branches during dormancy (early spring) and planting them directly into moist streambank soils, these cuttings can establish quickly, helping to reduce erosion, filter runoff, and improve wildlife habitat. Because the cuttings are sourced from existing trees in the area, they provide a free and locally adapted planting stock, making this an efficient and cost-effective method to enhance riparian function and resilience.

Adequate temperature, moisture, and sunlight are required for germination and establishment. In Connecticut, these conditions are typically met in late winter or early spring after the ground has thawed. To ensure successful establishment, sharp, clean tools such as loppers, pruners, or saws must be used to harvest the plant material. Vegetation should be cut at a 40 – 50-degree angle, with cuttings ranging from 0.5 to 2 inches in diameter and 2 to 7 feet in length. Because live cuttings have a minimal holding time, they must be installed the same day they are harvested. Proper installation requires firm contact between the cutting and the soil, which is achieved through soil compaction—either by foot or with equipment—to eliminate air pockets. Soil moisture must also be appropriate: if

it is too dry, particles will not effectively fill voids; if it is too wet, compaction becomes ineffective due to water displacement. Willow can tolerate partial shade but does best in open areas where competition for light is minimal. Therefore, it is important to plant willow cuttings in sunny areas to ensure faster rooting and more vigorous establishment. Willow can be planted as a single stem or in bunches of 5 to 10 and spaced 6 to 10 feet apart. Adhering to these guidelines ensures optimal rooting conditions and increases the likelihood of successful long-term restoration.

Tree Planting

Several properties in this stewardship plan are well-suited for new tree plantings - strategically placed along entryways, picnic areas, and playgrounds to encourage recreation. When planting, select healthy, native nursery stock (e.g., a 1.5-2" caliper sapling), dig a hole twice as wide as the root ball but only as deep as its root flare, and backfill with native soil and compost; create a 2-3" high donut ring at the edge of the root ball and water deeply at planting, then mulch generously (1-2" layer, with a lighter dusting closer to the trunk) to conserve moisture and suppress weeds and stake as needed. Mulching generously also creates a buffer zone that keeps mowers and weed trimmers at a safe distance. Even a quick nick from a blade or string can strip bark or sever tender cambium, fatally wounding a young trunk. To ensure successful establishment, it is recommended to water each tree planted with 25 gallons every week, especially during the summer months. If deer are a concern, install protective tree guards around the stem of young trees.

After the first year, verify that stakes remain secure yet loose enough to allow for slight trunk movement. Ensure the root flare is still at the soil line and monitor for signs of water stress or pests. Refresh the mulch as it settles. After about five years, once each tree has established a solid trunk and branching pattern, perform structural pruning. This timing prevents long-term structural defects, such as co-dominant stems or weak branch unions, and sets your tree up for a long, resilient life. Please refer to Appendix B for a comprehensive tree care guide.

Recreation

Trail Systems

Trail systems can be thoughtfully developed or improved at Hubbard Park, Joyce Street Park, Town Hall Grounds, Maplewood Park, and Samuel Wheeler Reed to enhance both recreational access and long-term stewardship. Well-designed trails provide a structured way for visitors to explore natural areas while minimizing disturbance to sensitive habitats. In locations like Samuel Wheeler Reed, trails can help concentrate foot traffic and reduce informal trail creation, which contributes to soil erosion, vegetation trampling, and the spread of invasive species.

Joyce Street Park, Maplewood Park, and Hubbard Park may serve more neighborhood-based visitors; trails can connect forested edges and playground areas to create loop systems that encourage short nature walks and interpretive opportunities. At the Town Hall Grounds, a trail system could integrate the arboretum and natural landscapes, offering a valuable opportunity to blend recreation with public education on urban forestry, wildlife habitat, or native species restoration.

Trail construction should be paired with effective signage, clear wayfinding, and comprehensive ongoing maintenance plans. Where feasible, these trails can also serve as corridors for future habitat monitoring, invasive species tracking, and volunteer-based stewardship activities.

Interpretive Signage

Installing new interpretive signs can enhance visitor engagement by providing educational information about local flora, fauna, and ecological processes. Emphasizing visual appeal, durability, and clear messaging helps ensure that new signage effectively enhances the visitor experience, fosters ecological understanding, and promotes long-term stewardship.

Additional interpretive signage might include:

- Bird Watching Basics: Tips for spotting and identifying common bird species in the preserve, with QR codes linking to bird call recordings.
- Nature-Inspired Art: Signs encouraging visitors to sketch or photograph scenes from the preserve.
- Literary Connections: Quotations or excerpts from authors or poets reflecting on nature and the landscape.
- Nature Scavenger Hunt: Interactive signage with challenges to find specific plants, animal tracks, or natural features.
- Milkweed and the Monarch Butterfly: The life cycle of monarch butterflies and how milkweed serves as a critical host plant.
- Oak Trees: The ecological significance of oak trees as a keystone species, supporting diverse wildlife and promoting forest health.
- Urban Heat Island Effect: how urban green spaces build climate resilience and help mitigate urban heat island effect by reducing ambient heat, improving air quality, reducing energy use, and enhancing community health.
- Red Maple Swamp: A Forest on the Water - These wetlands absorb excess stormwater, reducing flooding and filtering pollutants.

Boundary Management

We recommend that the property boundaries be clearly marked with signs facing out to alert the public that they are crossing into privately owned public land. The purpose of these signs would be to prevent encroachment and deter dumping. It is always preferable to reference the last survey conducted or, if a survey has never been conducted by a professional surveyor, to have one done. If that is not an option, setting boundary signs back far enough into the property to be confident of their place is also an option.

Community Engagement

Connecticut's forests are uniquely exciting – and uniquely challenged. As the fourth most densely populated state in the country and the 16th most forested state, Connecticut faces intense forest fragmentation. This fragmentation has created a patchwork of woodland interspersed with development, resulting in an abundance of forest edge – prime territory for invasive species to establish and thrive. The impact of this is evident: invasive plant pressure is among the most severe in the region, threatening native biodiversity, forest regeneration, and long-term ecosystem health.

But these challenges also bring opportunity. With such a large and diverse population, Connecticut is well-positioned to build a broad coalition of residents, volunteers, landowners, and community groups who can be mobilized to help steward these fragmented landscapes. Public interest in conservation, climate action, and urban greening continues to grow, creating fertile ground for engaging people in the hands-on work of invasive species management and ecological restoration.

The scale of potential involvement matches the scale of the problem. With the right tools, outreach, and collaborative planning, Bloomfield can serve as a model for community-powered forest stewardship in a densely populated landscape. Below are some practical ways to incorporate these steps into community-based projects and volunteer activities:

Organize Training Sessions

- Before heading into the field, offer a brief training on plant identification and the "why" behind each step.
- Demonstrate how to safely and accurately identify invasive vines vs. beneficial native vines or saplings.
- Show the "clip high, clip low" technique so everyone knows what to do when they see a vine climbing a tree.

Create Small Working Groups

- Divide volunteers into teams, each focused on a particular step or task. For instance, one group flags native saplings, another tackles vine removal on mature trees, etc.
- This approach keeps volunteers organized and allows each group to develop expertise, increasing the overall quality of work.

Provide Visual Cues & Simple Tools

- Supply pink ribbon or other flags to mark beneficial native plants so volunteers avoid cutting them by mistake.
- Hand out loppers, hand saws, or pruners – simple, lightweight tools that most people can use effectively.
- Use laminated ID cards or posters showing common invasive vs. native vines to reinforce knowledge in the field.

Plan Multiple Work Days

- Emphasize that removing invasive vines is an ongoing process. Schedule follow-up sessions in different seasons (e.g., spring, mid-summer, winter) to keep new vine growth in check.
- Maintaining a regular schedule builds momentum and keeps volunteers engaged.

Focus on High-Impact Areas First

- Start around mature trees where vines threaten the canopy – this gives volunteers an immediate sense of accomplishment when they free a large tree from vines.
- Next, target edges where vines often establish themselves and spread inward. Keeping edges clear helps protect the forest interior.

Encourage Safe Field Practices

- Highlight the benefits of winter work: fewer ticks, easier visibility of vine structures, and minimal disturbance to nesting birds.
- Provide safety gear if needed – gloves, protective eyewear, etc. – and ensure volunteers know how to handle tools correctly.

Use Low-Disturbance Techniques

- Remind volunteers to "clip and drop" cut vines, leaving them on the ground. Pulling up roots can disturb soil and damage nearby native seedlings.
- Stress that a few cuts done carefully are more effective than aggressively ripping vines out.

Celebrate Progress & Build Stewardship

- After each work session, gather to discuss what was accomplished: "We freed 10 mature oaks from vines!" or "We flagged 50 native saplings!"
- Share updates, photos, and success stories on community boards or social media to recognize volunteer efforts and encourage more participation.
- Consider small, tangible rewards or public acknowledgment for volunteers – such recognition fosters a deeper sense of stewardship.

Educate on the Bigger Picture

- Explain how removing invasive vines benefits wildlife, increases biodiversity, and ensures future canopy growth.
- Connect this work to local conservation goals, reinforcing that each volunteer is part of a larger movement to protect community green spaces.

Keep It Fun and Inclusive

- Invite youth groups, school clubs, or civic organizations to participate. Develop age-appropriate tasks (e.g., older children can flag young native trees, while adults handle cutting tools).
- Offer refreshments or plan a small picnic to make it a social and enjoyable experience.

By incorporating clear training, focusing on small, actionable tasks, and regularly celebrating successes, you'll create a positive volunteer experience that not only removes invasive vines but also fosters a lasting sense of community stewardship for local forests.

BLOOMFIELD WORK SUMMARY

Town of Bloomfield Connecticut				
Scheduled Work Summary 2025-2035				
Location	Action	Timing	Estimated Cost	Rationale
50%	Monitor and remove invasives and trash from forest edges	Even Years	$$	Controls spread of invasives, protects native species and canopy regeneration.
50%	Monitor and remove invasives and trash from forest edges	Odd Years	$$	Controls spread of invasives, protects native species and canopy regeneration.
LaSalette Park	Implement rotational invasive control and replant gaps	Annual	$$$	Controls spread of invasives, protects native species and canopy regeneration.
All	Mark forested property boundaries	2026-2027	$$	Controls spread of invasives, protects native species and canopy regeneration.
All	Training for maintenance crews on correct planting depth and mulching	2025	$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Lisa Lane Farm	Organize a clean-up event to remove trash, control invasives, and	2025	$	Improves public safety and forest access, removes barriers to restoration.
Pershing Park	Remove or prune hazardous trees	2025	$$	Improves public safety and forest access, removes barriers to restoration.
Public Works	Install mulch rings and deer guards	2025	$	Improves ecological resilience and supports forest health.
Filley Park	Address improper tree plantings	2025	$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Essex Park	Plant natives in park setting	2026	$	Controls spread of invasives, protects native species and canopy regeneration.
West Eggleston Park	Plant ornamentals near benches/sidewalks	2026	$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
West Eggleston Park	Provide trash receptacles or compost stations near entrances	2026	$	Improves ecological resilience and supports forest health.
Hubbard Park	Native tree plantings park parcel	2026	$$	Controls spread of invasives, protects native species and canopy regeneration.
Pershing Park	Plant shade trees to enhance park setting	2026	$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Essex Park	Plant shade trees to enhance park setting	2026	$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
All	Inspect Recent Tree Plantings	2027		Ensure Survival and Establishment - catch planting defects early

Board of Education	Clean dump sites and remove large debris	2027	$	Improves public safety and forest access, removes barriers to restoration.
Farmington River Park	Engage stakeholders to clarify use and discourage encroachment	2027	$	Improves ecological resilience and supports forest health.
Vista gardens, LaSallette, Samuel Wheeler	Investigate feasibility of implementing grassland restoration projects	2027	$$$	Grasslands support a unique and declining suite of native plants, birds, pollinators, and other wildlife that depend on open habitat for survival.
Rockwell Park	Begin clearing out invasive midstory to establish forest classroom	2027	$	Clearing out the invasive midstory will create a park like savanna with well-spaced canopy trees.
All	Inspect Recent Tree Plantings	2028	$	Ensure Survival and Establishment - plan for replacements
Mary Hill Green	Introduce pollinator gardens to add ecological value	2028	$	Improves ecological resilience and supports forest health.
Maplewood Park	Develop reforestation strategy	2028	$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Pershing Park	Consolidate or remove the double fence	2028	$$$	Improves public safety and forest access, removes barriers to restoration.
Essex Park	Remove or replace outdated fencing; Target invasive plants	2028	$$	Improves public safety and forest access, removes barriers to restoration.
Mary Hill Green	Consider planting native understory ornamentals (e.g., redbud, dogwood)	2029	$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Filley Park	Plant native hardwood seedlings	2029	$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover. monitor tree health - find and encourage regeneration
Joyce Street Park	Install trail loop with educational signage	2029	$$$	Supports public engagement and education, guides low-impact recreation.
Rockwell Park	Revisit site and mow down any new invasive regrowth or spot treat with herbicide	2029	$$	Spread much or grass seed and encourage the transition into a park like savanna. Add picnic tables and benches
LaSalette Park	Develop educational trails and install signage	2030	$$$	Supports public engagement and education, guides low-impact recreation.
Wilcox Park	Develop and install educational signage	2030	$$$	Supports public engagement and education, guides low-impact recreation.
All	Structural pruning for recently planted strees	2031	$	Well-timed pruning directs energy into a strong central leader and well-spaced scaffold branches. Strategic early pruning reduces the need for large corrective cuts later and extends tree lifespan.
Maplewood Park	Implement reforestation strategy	2031	$$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.

Samuel Wheeler Reed and Schools	Plant native wet-tolerant species to restore canopy gaps	2032	$$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Maplewood Park	Continue reforestation strategy	2032	$$$	Enhances biodiversity, improves aesthetics, and provides future canopy cover.
Samuel Wheeler Reed and Schools	remove old fencing	2032	$$	Improves public safety and forest access, removes barriers to restoration.
Town Hall Grounds	Install loop trail with interpretive signage	2033	$$$	Supports public engagement and education, guides low-impact recreation.
Rockwell Park	Reassess invasive pressures, retreat as necessary	2033	$$	Supports communities by providing a place to read and engage with the natural surroundings.
Laurel School	Repair fences and discourage dumping	2033	$$	Clarifies property lines and prevents dumping or unmanaged use.
Maplewood Park	Reforestation Maintenance	2034	$	clear out invasives and replace mortality
Laurel School	Stabilize slopes with deep-rooted native shrubs and trees	2034	$$	Improves ecological resilience and supports forest health.
Wilcox Park	Promote multi-age structure with selective thinning	2035	$$$	Improves ecological resilience and supports forest health.
All	Refresh boundaries	2035	$$	Supports public engagement and education, guides low-impact recreation.

$ = $0 to $3,000 $$ = $3,000 to $6,000 $$$ = $6,000 to $10,000 $$$$ = Greater than $10,000

Picture 9 View from Wilcox Park

INVASIVE REMOVAL AND RESTORATION PLANS

Two Year Invasive Management Strategy

The phased restoration strategy outlined below provides a strong model for addressing invasive species at sites like LaSalette Park in Bloomfield, which suffer from extensive infestation. Over time, a strategy of adaptive management, community engagement, and seasonal planting can convert heavily invaded forests into functional, resilient, and aesthetically pleasing parkland.

Year 1: Initial Invasive Removal and Site Preparation (Spring – Fall)

- **Priority Areas:** Start invasive removal along trail corridors and easily accessible open spaces. This approach increases visibility of work, enhances public support, and provides immediate improvement in aesthetics and visitor experiences.
- **Target Species:** Asiatic bittersweet, multiflora rose, autumn olive, tree of heaven, glossy buckthorn, and bush honeysuckle. These invasive species aggressively compete with native vegetation and severely limit regeneration.
- **Protect Existing Trees:** Clearly identify valuable mid-story trees currently compromised by vines and autumn olive. Flag these trees and clear invasive vegetation in rings approximately 15-20 feet around them.
- **Methodology:**
    - Deploy a combination of mechanical cutting and targeted herbicide application.
    - "Clip High, Clip Low" technique to control bittersweet vines.
    - Utilize volunteer labor for lighter tasks and contractors for intensive mechanical removals.
- **Contracting:** Engage a consultant for technical oversight, volunteer training, and mechanical removal. Tools and equipment should be purchased to support volunteer efforts.
- **Volunteer Engagement:** Conduct outreach to build and train a robust volunteer workforce for regular invasive removal events throughout the season.

Tree Planting (Fall)

- **Timing:** Begin tree planting in cleared areas in fall (October–November), more optimal for tree establishment due to cooler temperatures and increased rainfall. Plantings can be conducted in fall and spring but never during the summer months.
- **Location:** Plant trees in areas cleared during the initial invasive species removal efforts to immediately occupy and reclaim the growing space.
- **Species Selection:** Choose native, site-appropriate trees and shrubs adapted to coastal and brackish conditions.
- **Planting Method:** Utilize a mix of containerized seedlings for cost-effectiveness and ball-and-burlap specimens for immediate structural impact.
- **Watering & Maintenance:** It is recommended to organize a watering regimen immediately following planting to ensure high survival rates through establishment periods.

Year 2: Intensive Invasive Management (Spring – Fall**)**

- **Expanded Areas:** Move deeper into the preserve, targeting more densely invaded zones and prioritizing blocks near initial restoration sites to prevent reinvasion.
- **Repeated Treatments:** Utilize lessons learned from Phase 1; continue mechanical and chemical treatments, focusing on dense patches of autumn olive, bush honeysuckle, buckthorn, and tree of heaven, and remaining invasive vines.
- **Consulting & Volunteer Efforts:** Contract for consultant oversight, supplemented by volunteer participation.

Expanded Tree and Shrub Planting (Fall)

- **Continued Reforestation:** Plant additional trees/shrubs to expand restored areas, enhance structural diversity, and ensure habitat continuity.
- **Maintenance:** Conduct watering and maintenance throughout the growing season, encouraging high survival rates and healthy establishment of new plantings.

Strategic Recommendations for Ongoing Success

- **Continuous Monitoring:** Schedule bi-annual monitoring to quickly identify and manage invasive regrowth and ensure successful native vegetation establishment.
- **Adaptive Management:** Adjust planting and maintenance practices annually based on monitoring outcomes and vegetation response.
- **Community and Organizational Partnerships:** Sustain strong local partnerships to ensure ongoing volunteer engagement, financial support, and successful stewardship.

Management Block-Based Approach

A block-based management approach provides a practical, repeatable framework for restoring degraded areas across a site, one manageable unit at a time. Designed around 50' x 50' squares, the strategy allows stewardship crews to focus efforts efficiently – prioritizing invasive removal, protecting existing native vegetation, and replanting with site-appropriate species. By adapting each block to its unique conditions – whether trail edge, interior forest, or wetland transition – this method supports targeted restoration and simplifies long-term monitoring and maintenance. It's a scalable model well-suited for parks with widespread invasive pressure and limited resources, allowing for steady progress and clear documentation. The following outlines a general approach for invasive removal, site preparation, planting, and monitoring of management blocks.

Identify Your Management Block

- Establish management block using aerial imaging and on-the-ground conditions.
- Identify block designation:
    - Edge (along trails or clearings),
    - Interior forest, or
    - Wetland transition (upland to wetland edge).

Survey and Flag Native Vegetation

- Carefully inspect the plot for any native saplings or shrubs
- Flag these with ribbon or colored tape for protection. These may be future canopy or midstory contributors.
- Record species, if possible, for monitoring.

Remove Invasive Vegetation

- **Prioritize removal** of aggressive vines and thorny species first:
    - Asiatic bittersweet, Japanese honeysuckle, multiflora rose.
- **Followed by** the removal of dense mid-story light-blocking invasives:
    - Autumn olive, multiflora rose, bush honeysuckle, tree-of-heaven, etc.
- Clear and contain:
    - Cut stems at the base using loppers or saws.
    - For larger stems, consider using herbicide within 1 hour to prevent resprouting.
    - Clip bittersweet vines high and low and leave vines in the canopy to prevent branch damage, self-injury, and provide decomposer habitat in the canopy.

- Stack brush for future removal or create low wildlife brush piles outside of main visitor corridors.

Prepare Soil for Planting

- Loosen compacted soil, remove competing roots, and add soil amendments.
- In wetter blocks, ensure no pooling or ponding that could drown young seedlings unless wet-tolerant species are selected.

Plant Native Trees, Shrubs, or Grasses

- Select species based on site conditions and light availability:
    - **Sunny trail edge and canopy gap**: oak, hickory.
    - **Interior**: serviceberry, red maple, linden.
    - **Marsh edge**: speckled alter, red dogwood, river birch.
- **Spacing**:
    - 1 tree or 2-3 seedlings per block (spacing ~10-15 ft apart).
    - 1-2 shrubs per block (spacing ~5-8 ft apart).
- **Mulch** and install deer protection if needed.

Record and Mark Progress

- Document what was removed and planted.
- Note flagged trees, surviving native vegetation, and any brush piles created.
- Mark block with a small colored stake or number for follow-up monitoring.

Monitor and Maintain

- Return to the block at least twice per year to:
    - Check for resprouting invasives,
    - Water new plantings if needed,
    - Reapply herbicide if needed,
    - Replant failed seedlings, if applicable.

Block Summary Record-Example

Block A7 (Edge-Trailside):

- Cleared bittersweet, honeysuckle, and autumn olive
- Released one 6" DBH red oak and two Eastern red cedars
- Planted 1 red oak (ball and burlap), 2 winterberry (2 gal pots), 3 plugs of switchgrass
- Created 1 small brush pile for habitat at NE corner
- Marked for follow-up in June and October

GRASSLAND RESTORATION

Grasslands, shrublands, and young forests – across the northeastern United States are in urgent need of restoration. These habitat types, once maintained by fire, agriculture, and other forms of disturbance, have dramatically declined due to urbanization, forest succession, and changes in land use practices. As a result, wildlife species that rely on these open and semi-open habitats – such as grassland birds, New England cottontails, and early-successional butterflies – have experienced significant population declines. While some habitat loss is natural, much of it is directly tied to human activity, including fire suppression, development, and intensive agriculture. Site-specific management – invasive removal, prescribed fire, mowing, and strategic planting – is essential to sustain these habitats.

LaSalette Park, Vista Gardens, and Samuel Wheeler Reed each contain expansive grassland areas that represent significant opportunities for habitat restoration – but these spaces currently lack the thoughtful management needed to support long-term ecological health. Effective habitat management relies on selecting the appropriate technique based on ecological goals, landscape conditions, and target wildlife species. Management options such as prescribed grazing, mechanical treatments, herbicide application, and prescribed fire, each providing unique advantages over conventional mowing.

Herbicide Use

Herbicides, when used responsibly and with proper training, can be a highly effective tool for controlling invasive plants that threaten native biodiversity and ecological integrity. Although often controversial due to concerns about environmental and health impacts, herbicides can play a critical role when mechanical methods are ineffective or impractical – particularly in large-scale infestations or in sensitive habitats where precision is necessary.

Successful herbicide application depends on thorough site knowledge, including the presence of wetlands, rare species, or other sensitive resources, and choosing the right product, concentration, and application method for the target species. Techniques such as foliar spraying, cut-stem treatment, basal bark application, and herbicide injection each offer varying levels of precision and impact, allowing managers to tailor their approach to specific conditions. Special care must be taken near water bodies or when non-target species are present, and all label instructions must be strictly followed as a matter of law and best practice.

While herbicide use requires regulatory awareness and often licensing, it offers a valuable and scalable option in an integrated management plan. When combined with mechanical treatments, monitoring, and ecological restoration strategies, herbicides can help reclaim degraded habitats and support long-term conservation outcomes.

Prescribed Fire

Prescribed fire is a powerful, natural tool for restoring and maintaining early-successional habitats in the Northeast, including grasslands, shrublands, and fire-dependent ecosystems such as pitch pine-scrub oak barrens. Historically, fire played a significant ecological role in shaping these landscapes, both through lightning strikes and intentional burning by Indigenous peoples. Today, however, prescribed fire is underutilized in the region due to regulatory, logistical, and liability challenges.

For land managers considering fire, the first step is to understand local fire history and assess whether fire is appropriate for the habitat type and restoration goals. When applied correctly, fire can achieve outcomes that other tools cannot, including reducing thatch, recycling nutrients, suppressing invasives, promoting seed germination, and

improving habitat for rare or declining species. Fire can be especially beneficial when used in combination with other treatments like mowing or thinning.

Safe and effective implementation requires a detailed burn plan, trained personnel, interagency coordination, and consideration of weather, fuel conditions, smoke management, and public safety. Although barriers exist, building a small-scale prescribed fire program – particularly in grassland and old field settings – can be a cost-effective way to restore degraded habitats, reduce wildfire risk, and achieve both ecological and community safety objectives.

Prescribed Grazing

Prescribed grazing is an adaptable and effective strategy for enhancing wildlife habitat by using livestock to mimic natural disturbance processes. When carefully planned, grazing can help maintain and improve grassland, old field, and shrubland habitats that are critical for many declining wildlife species in the Northeast. By strategically rotating animals through a series of paddocks, land managers can influence plant community structure, suppress woody growth, and promote desirable forage species – much like fire or mechanical mowing.

The success of a grazing plan hinges on clearly defined goals, including the type of wildlife targeted and the livestock production objectives. Different animals – such as cattle, goats, or sheep – have unique foraging behaviors and impacts on the landscape. For example, goats are particularly effective at controlling woody vegetation, while sheep may be better suited for maintaining open grassland without damaging sensitive soils. Grazing plans should also account for infrastructure needs, including fencing, water systems, and shelter, and be flexible enough to adjust to changing conditions or wildlife needs (e.g., nesting bird seasons).

Ultimately, prescribed grazing offers a dynamic, scalable, and often cost-effective method for restoring and maintaining early-successional habitats. When coordinated with technical experts and based on careful observation of land and animal responses, it can be a powerful conservation tool that benefits both livestock producers and native wildlife.

When Mowing is the Chosen Option

When none of these specialized methods are feasible, mowing remains a viable habitat management option. To maximize wildlife benefits while minimizing habitat disturbance, mowing should typically occur every 2-3 years. Timing is crucial; mowing should be conducted after the primary breeding season (late summer to early fall) to avoid disrupting wildlife, particularly ground-nesting birds. Additionally, avoiding peak plant growth periods allows vegetation to complete reproductive cycles and supports pollinator populations.

Summary

Herbicides:

- Highly selective control, especially effective against invasive species that are resistant to mechanical removal or grazing.
- Cost-effective in controlling widespread invasive plant infestations.
- Less physical disturbance to the soil and surrounding vegetation compared to mechanical methods.

Fire:

- Ecologically beneficial by mimicking historical natural disturbances.
- Effective at large scales, promoting biodiversity and structural heterogeneity.
- Enhances soil nutrients through ash deposition.
- Effective tool for managing fire-adapted ecosystems such as grasslands and shrublands.

Grazing:

- Effective in managing diverse vegetation selectively without removing all plant cover.
- Simultaneously supports agricultural production and wildlife habitat enhancement.
- Enhances habitat structure beneficial for grassland birds and browsing wildlife species.
- Environmentally sensitive method, particularly useful in wet or steep terrains where machinery use might cause damage.

Mowing:

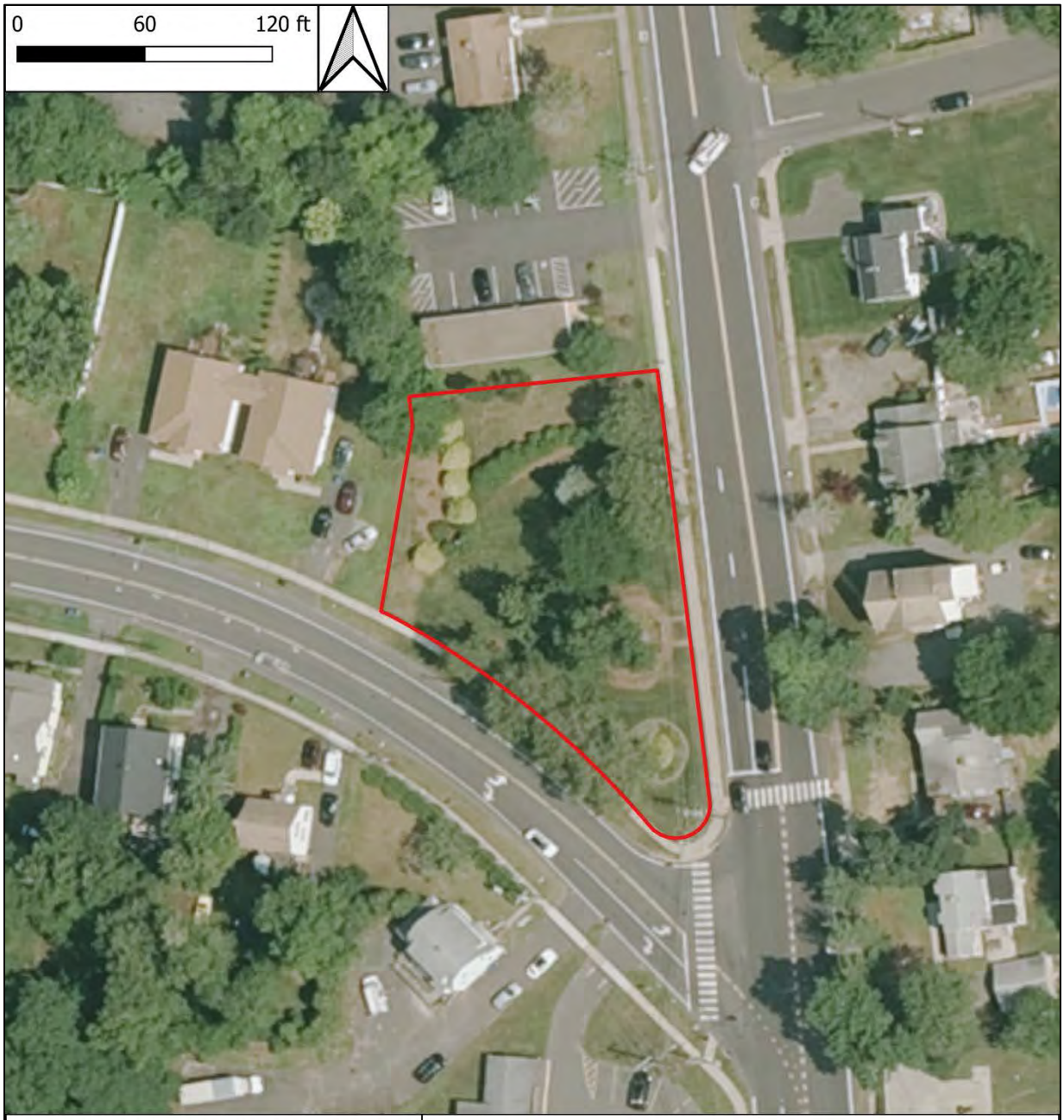
- **Mow once every 2-3 years** to maintain habitat structure beneficial to wildlife without overly disturbing the site.
- Conduct mowing after peak breeding season (late summer to early fall) to avoid disrupting wildlife, especially nesting birds.
- Avoid mowing during peak growth seasons to allow plants to complete their reproductive cycles and support pollinators.

HERBICIDE USE

All chemical treatments described in this report are conceptual recommendations only. Any herbicide application should be planned and executed by a pesticide applicator who is currently licensed and insured in the State of Connecticut and must follow all label directions, federal and state pesticide regulations, and CT-DEEP coastal-zone permit requirements.

APPENDIX A - Maps

Mary Hill Green



BASE LAYER: AERIAL IMAGERY IS FROM BING 2020. BOUNDARY AND STAND LINES WERE CREATED BY CONNWOOD FORESTERS FOR PLANNING PURPOSES ONLY. NO DATA IN THIS DRAWING IS TO BE CONSIDERED SURVEY GRADE.

Mary Hill Green

Bloomfield, CT

1035 Blue Hills Ave,
Bloomfield, CT 06002

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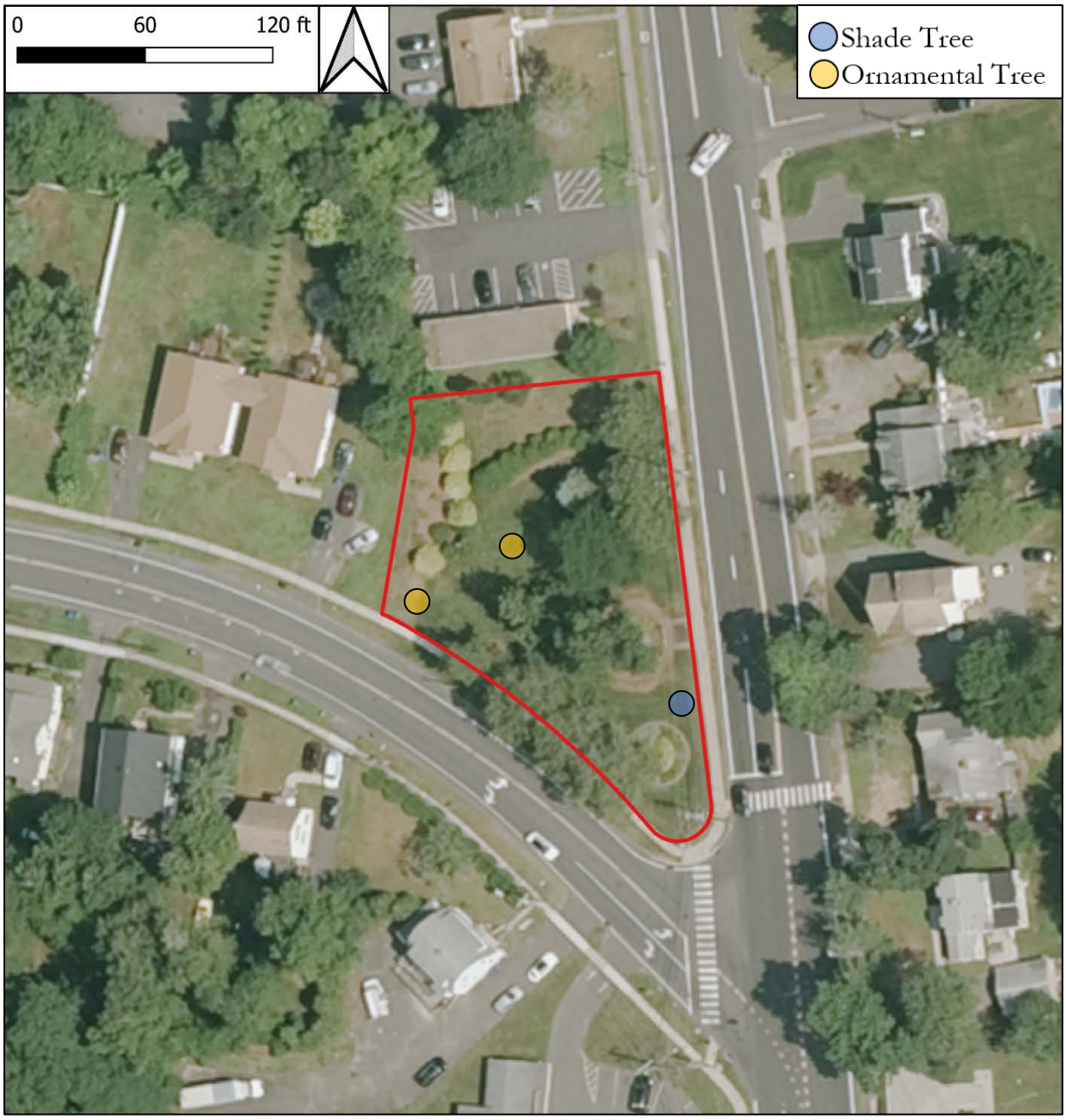

- Introduce pollinator gardens to add ecological value
- Consider planting native understory ornamentals (e.g., redbud, dogwood)

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West Eggleston Park

Bloomfield, CT

47-51 W Eggleston St, Bloomfield, CT 06002

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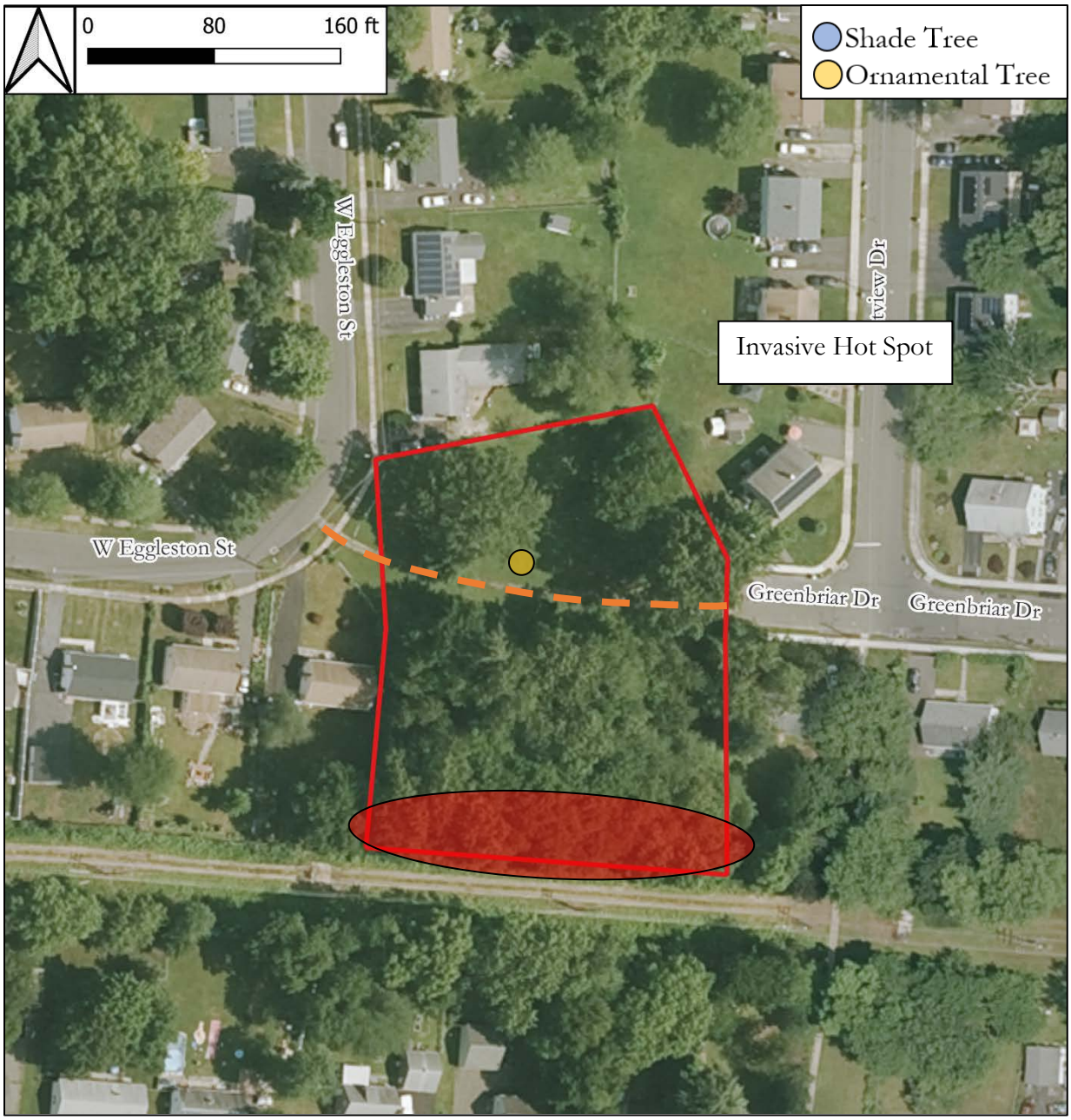

- Regularly monitor edges for invasive expansion
- Provide trash receptacles or compost stations near entrances
- Plant ornamentals near benches/sidewalks

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Sinnot Farm

Bloomfield, CT

72-52 Deerfield Rd, Bloomfield, CT 06002

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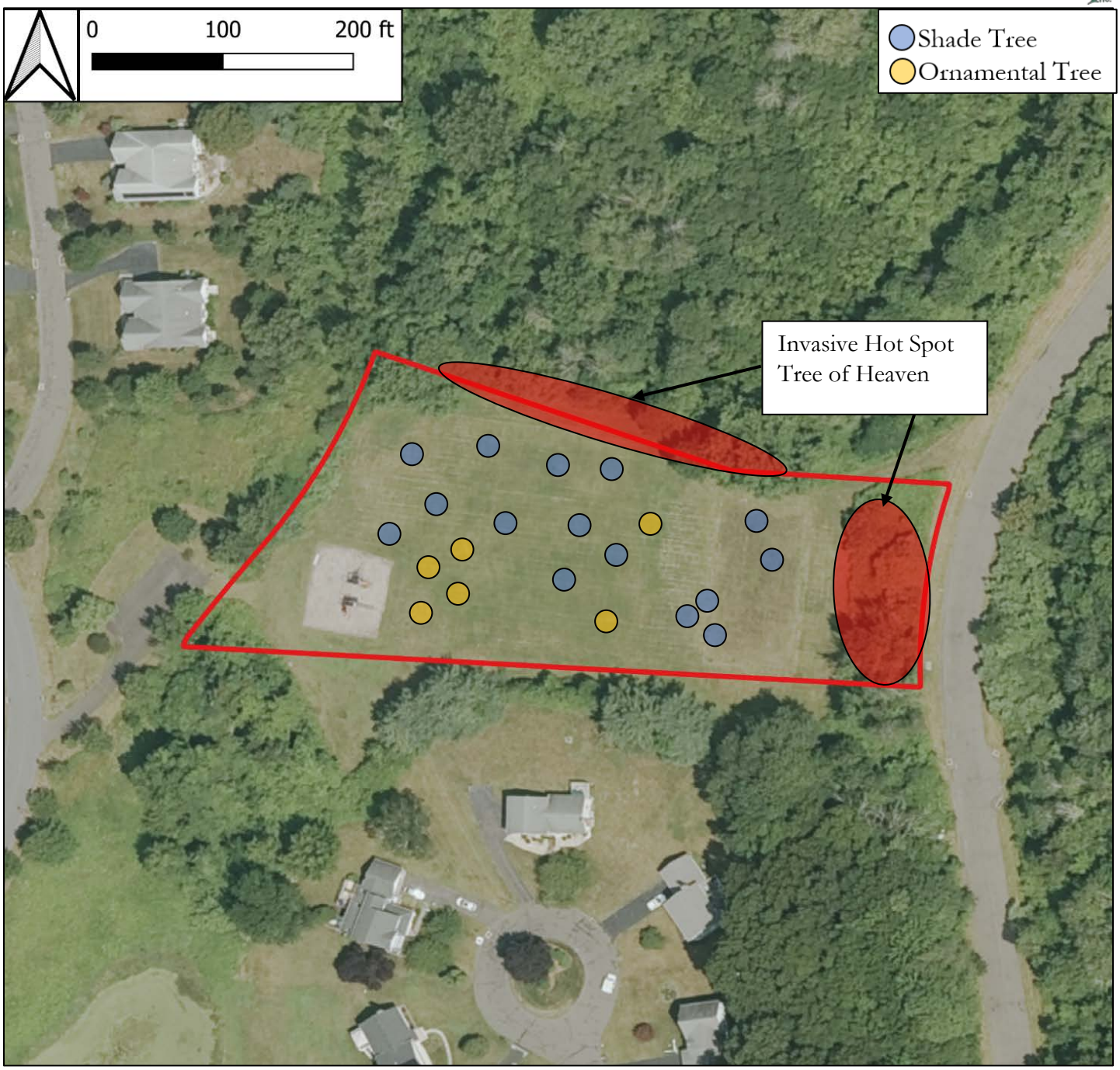
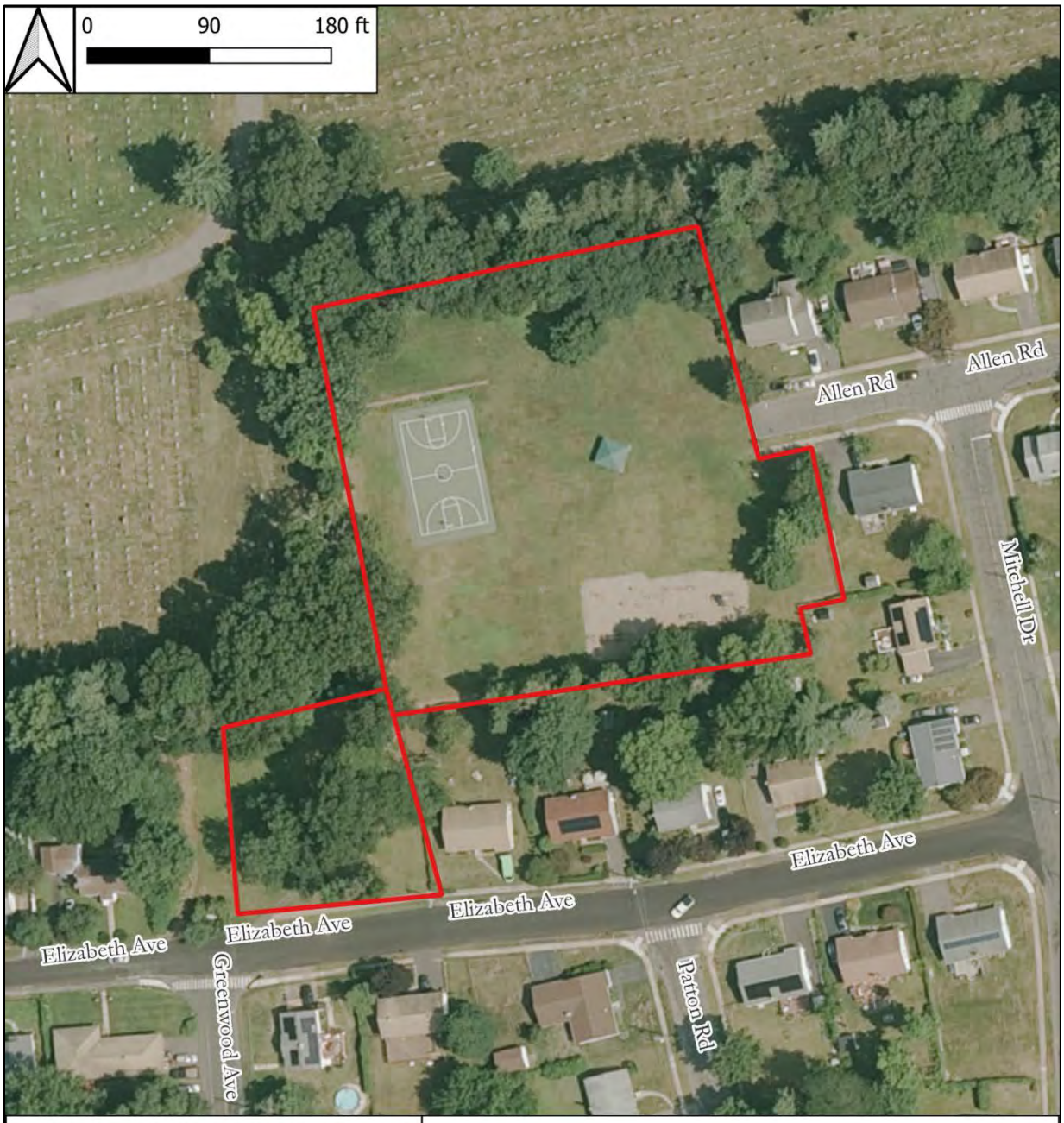


- Target tree-of-heaven with herbicide or removal protocols be careful not to remove Sumac (which look similar)
- Regularly inspect and remove invasives around forest edge
- Plant trees to create a more park like setting
- Add educational signage and trash receptacles to discouraging waste dumping

Pershing Park



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Pershing Park

Bloomfield, CT

71 Silo Way, Bloomfield, CT 06002

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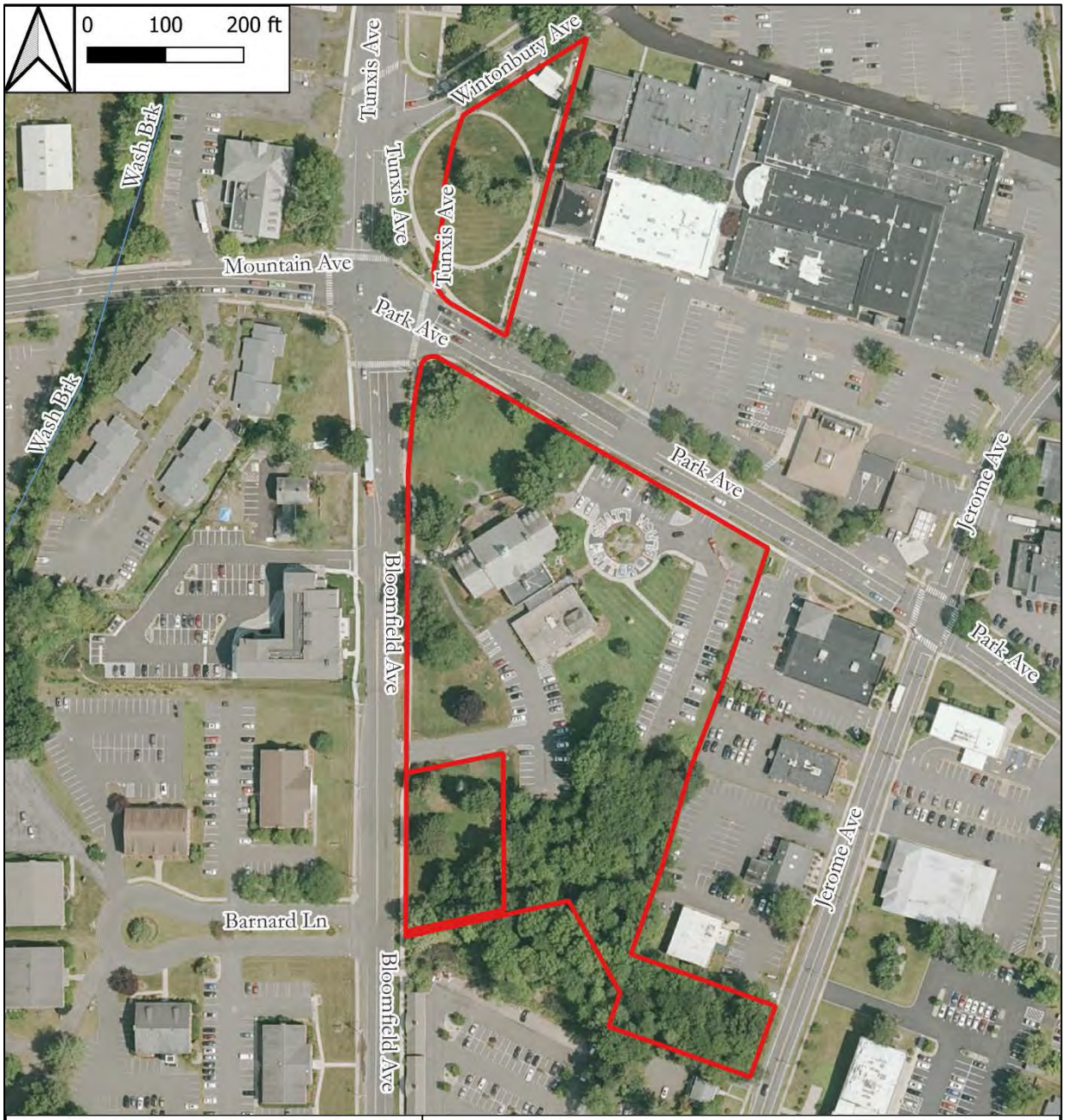
- Remove or prune hazardous trees near power lines
- Consolidate or remove the double fence
- Develop a planting strategy to maintain park canopy cover

Town Hall Grounds



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Town Hall Green

Bloomfield, CT

800 Bloomfield Ave, Bloomfield, CT 06002

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- Monitor edges for invasive incursion
- Install trail with interpretive signage
- Plant more trees in green depending on public use of space

Lisa Lane Farm

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Lisa Lane Farm

Bloomfield, CT

Lisa Ln, Bloomfield, CT 06002

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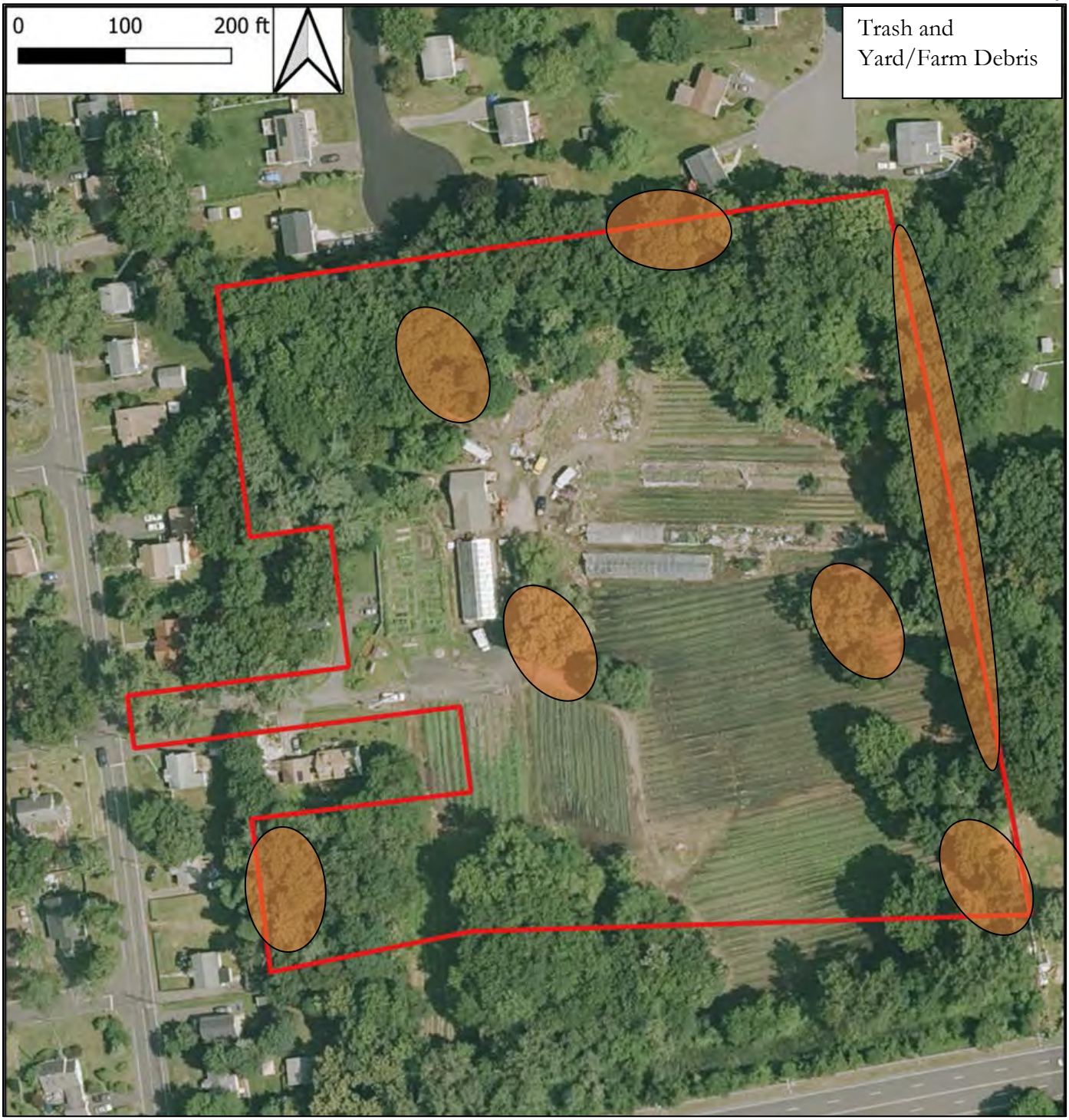
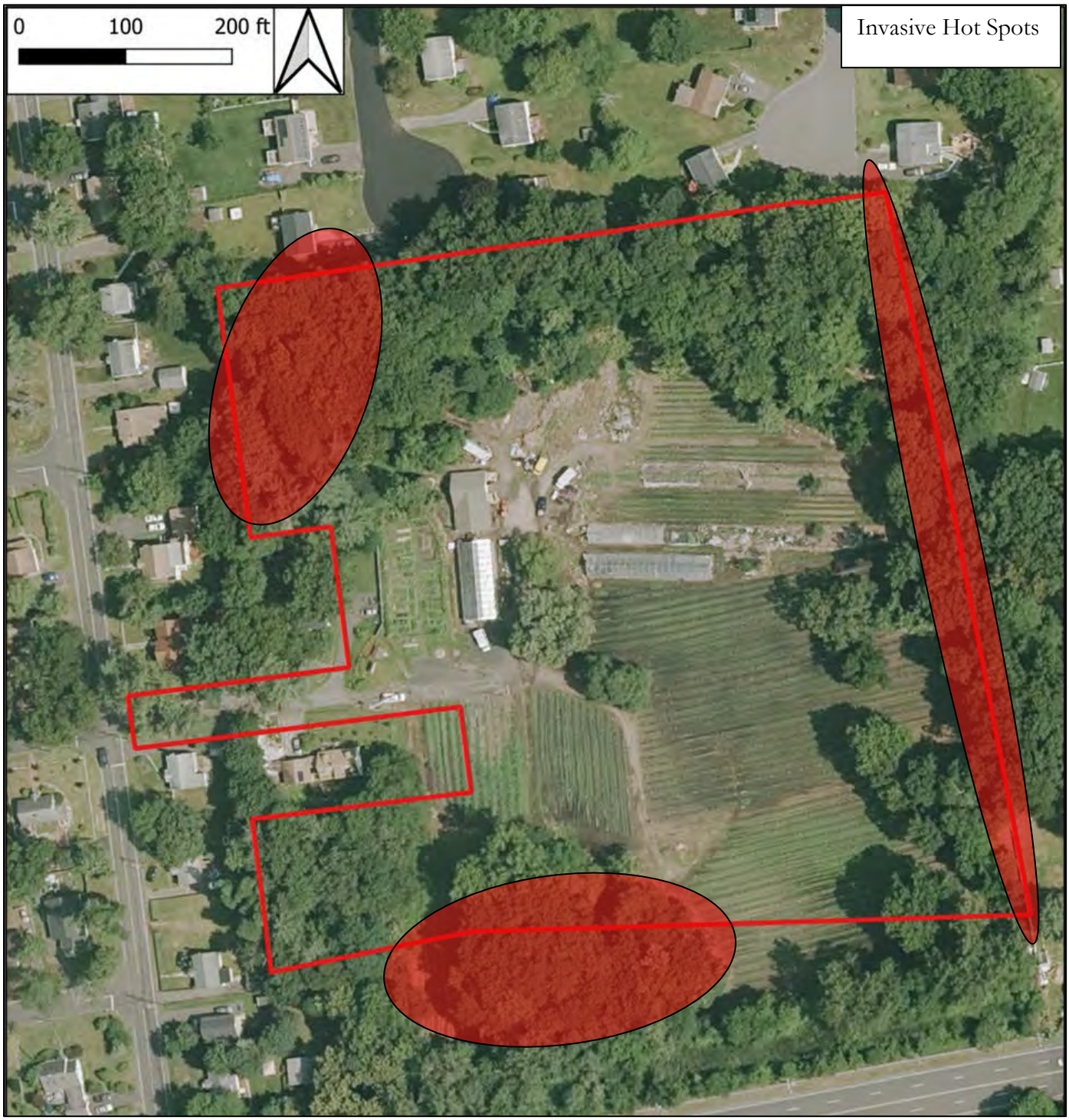
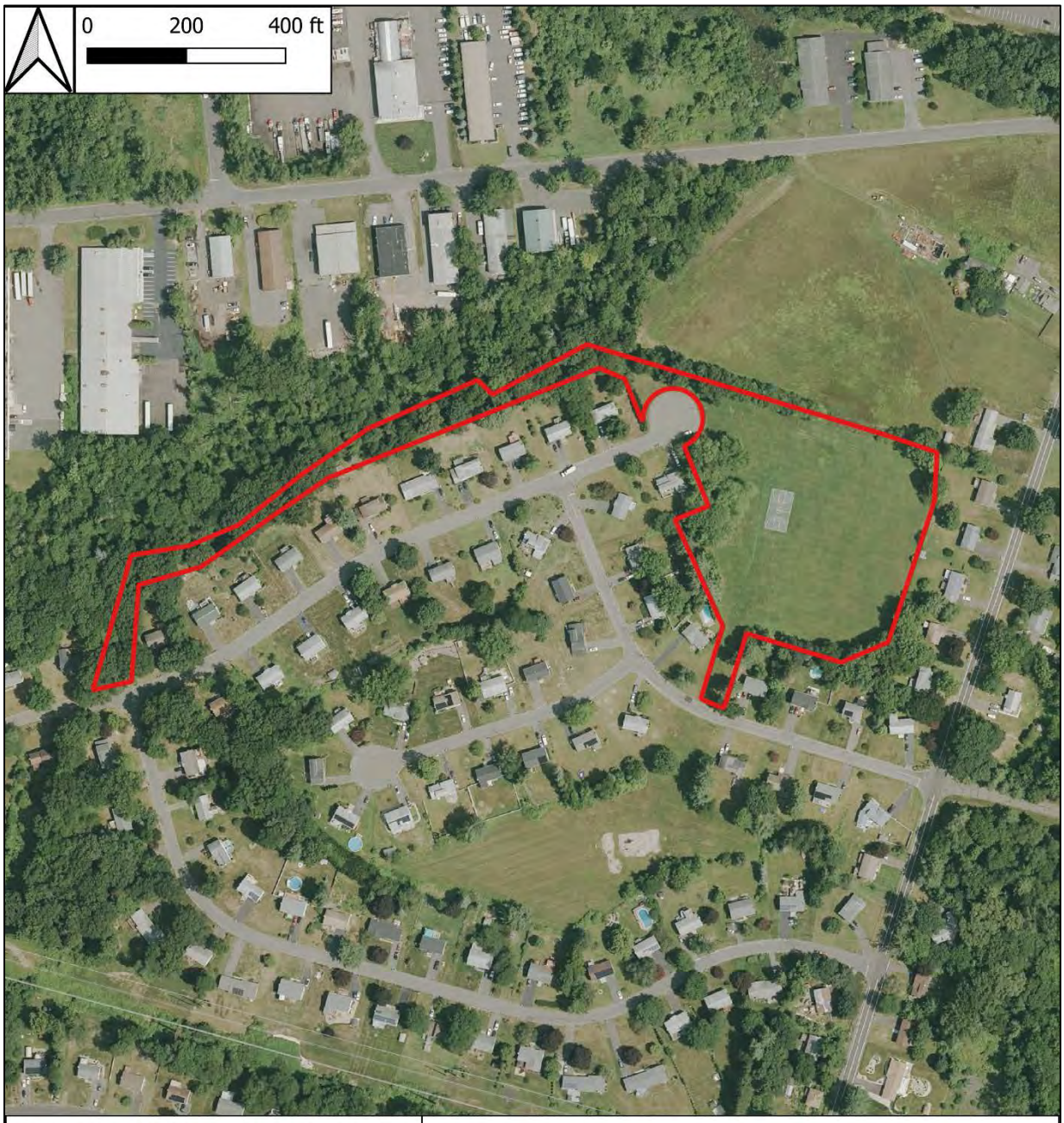


- Organize a community event to remove trash and control invasive species.
- Mark property boundaries


0
100
200 ft
Invasive Hot Spots



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Essex Park

Bloomfield, CT

9 Essex Ln, Bloomfield, CT 06002

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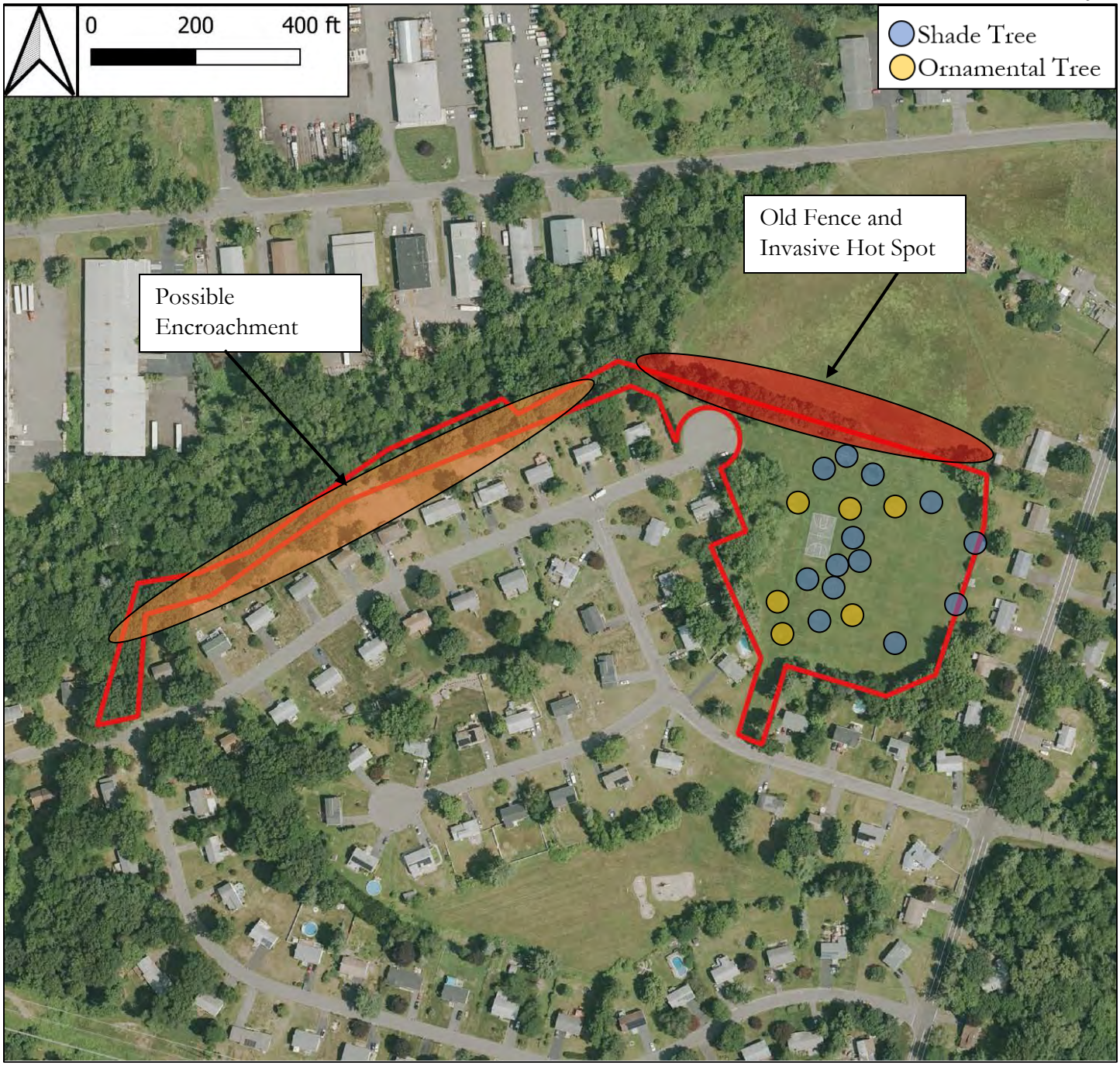
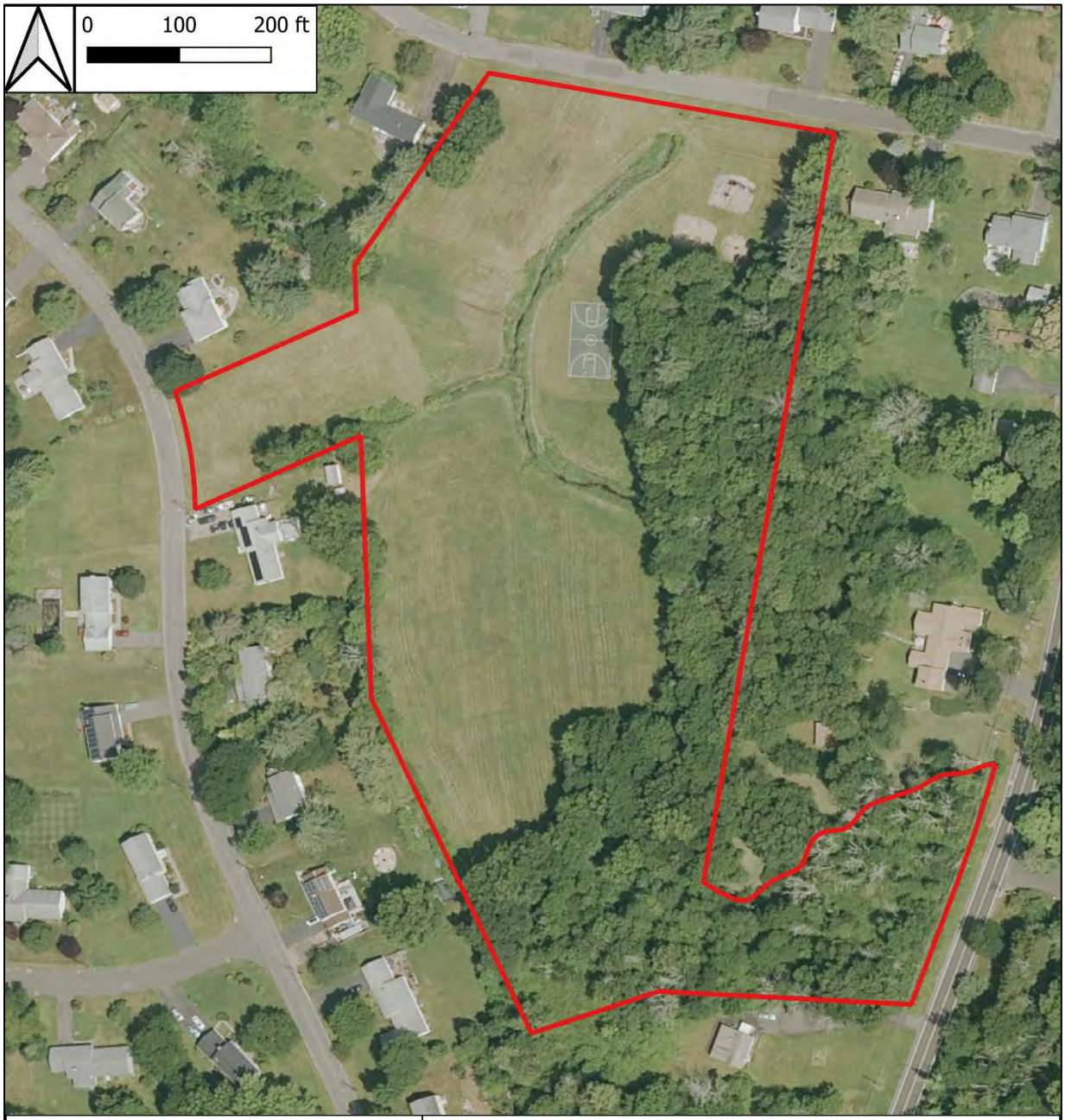


- Remove outdated fencing
- Target invasive plants on forest edges
- Plant shade trees to develop park setting

Maplewood Park



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Maplewood Open Space

Bloomfield, CT

56 Burnwood Dr, Bloomfield, CT 06002

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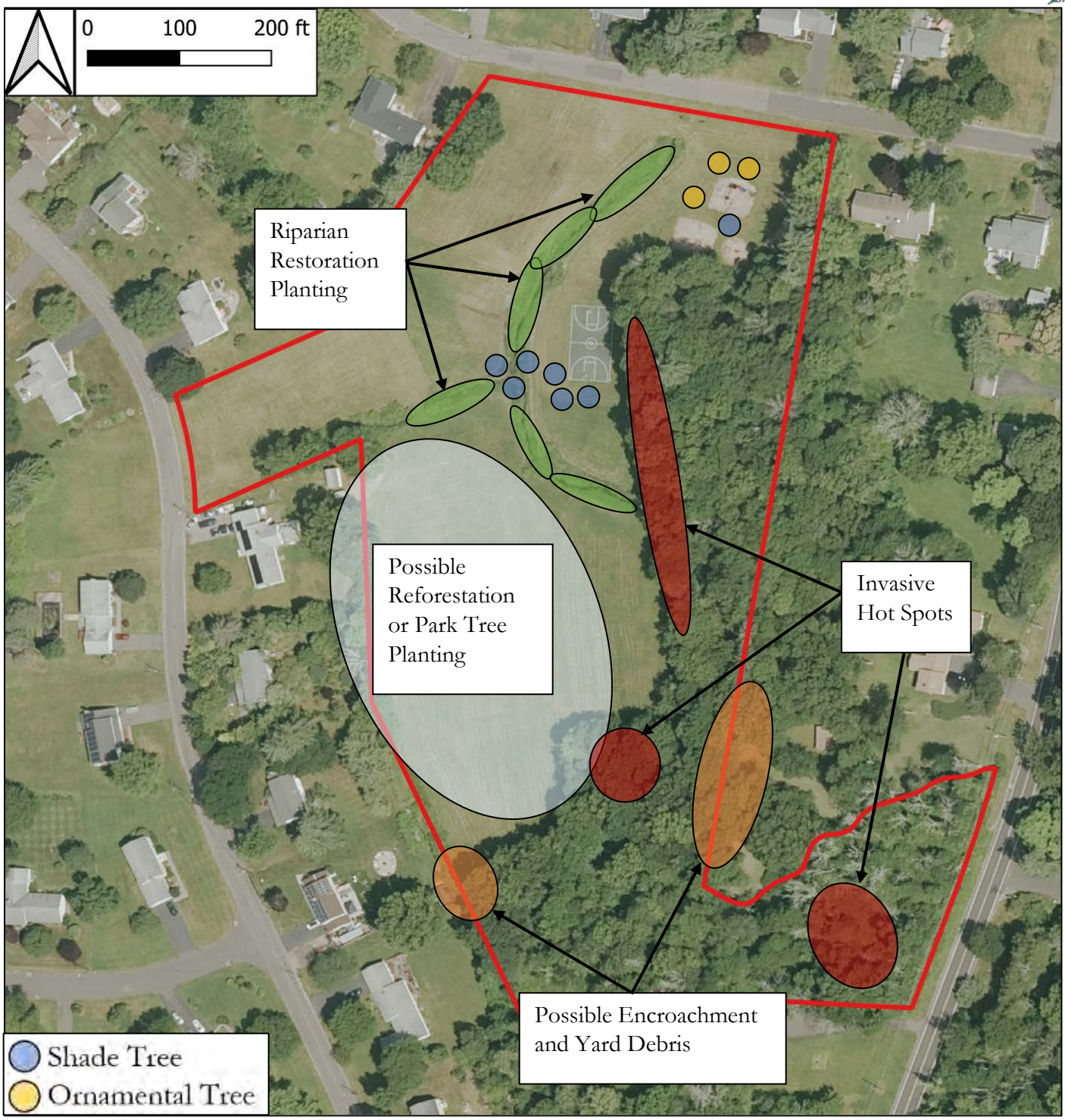
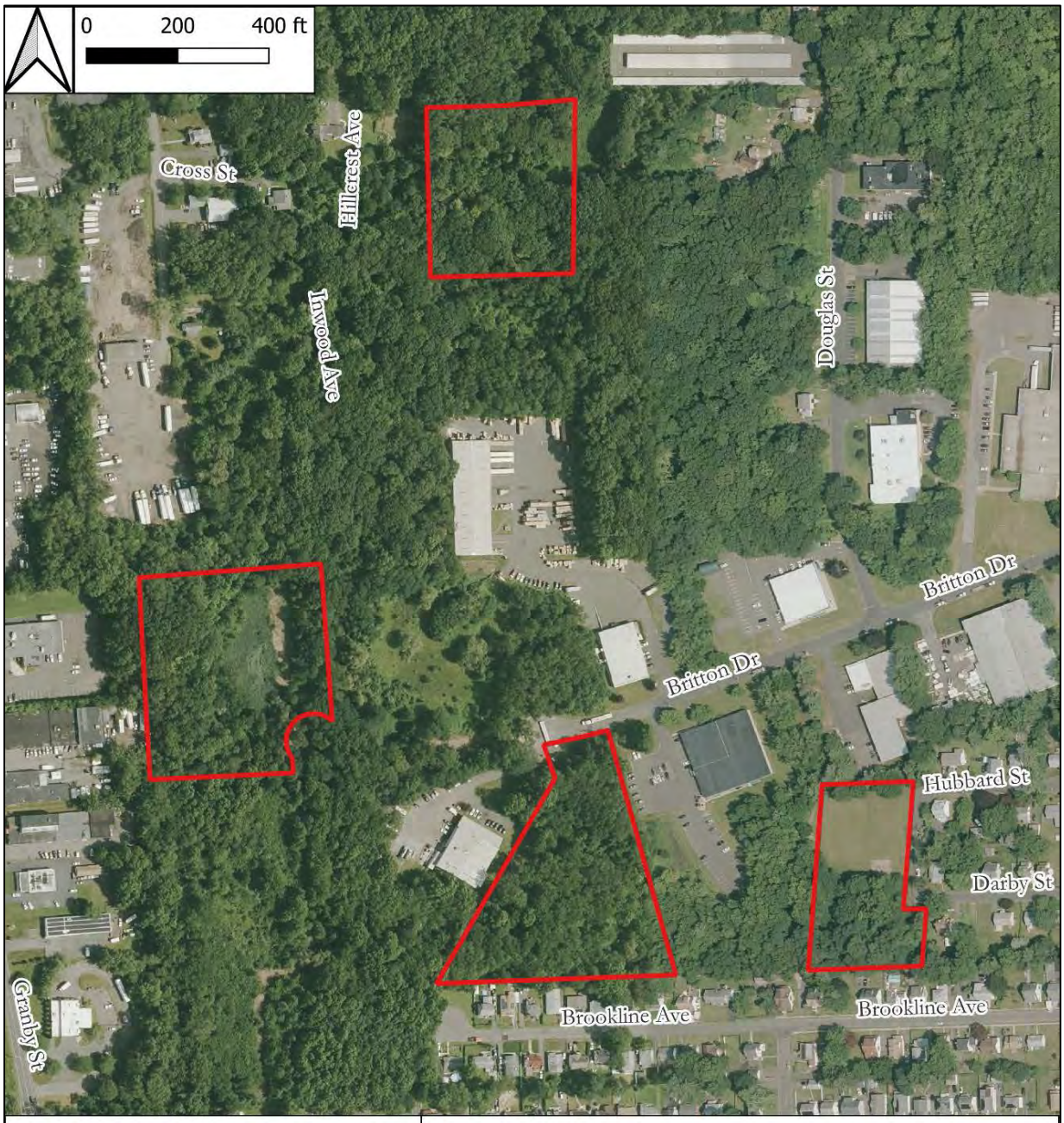


- Focus on edge management of invasive shrubs
- Organize a community event to remove trash and control invasive species.
- Mark property boundaries
- Plant native buffers to stabilize wet/erosion-prone soils
- Explore possibility of reforestation in southern half of park or plant a mixture of shade and ornamental trees to establish a park like setting



Hubbard Park

Bloomfield, CT

122-121 Hubbard St, Bloomfield, CT 06002

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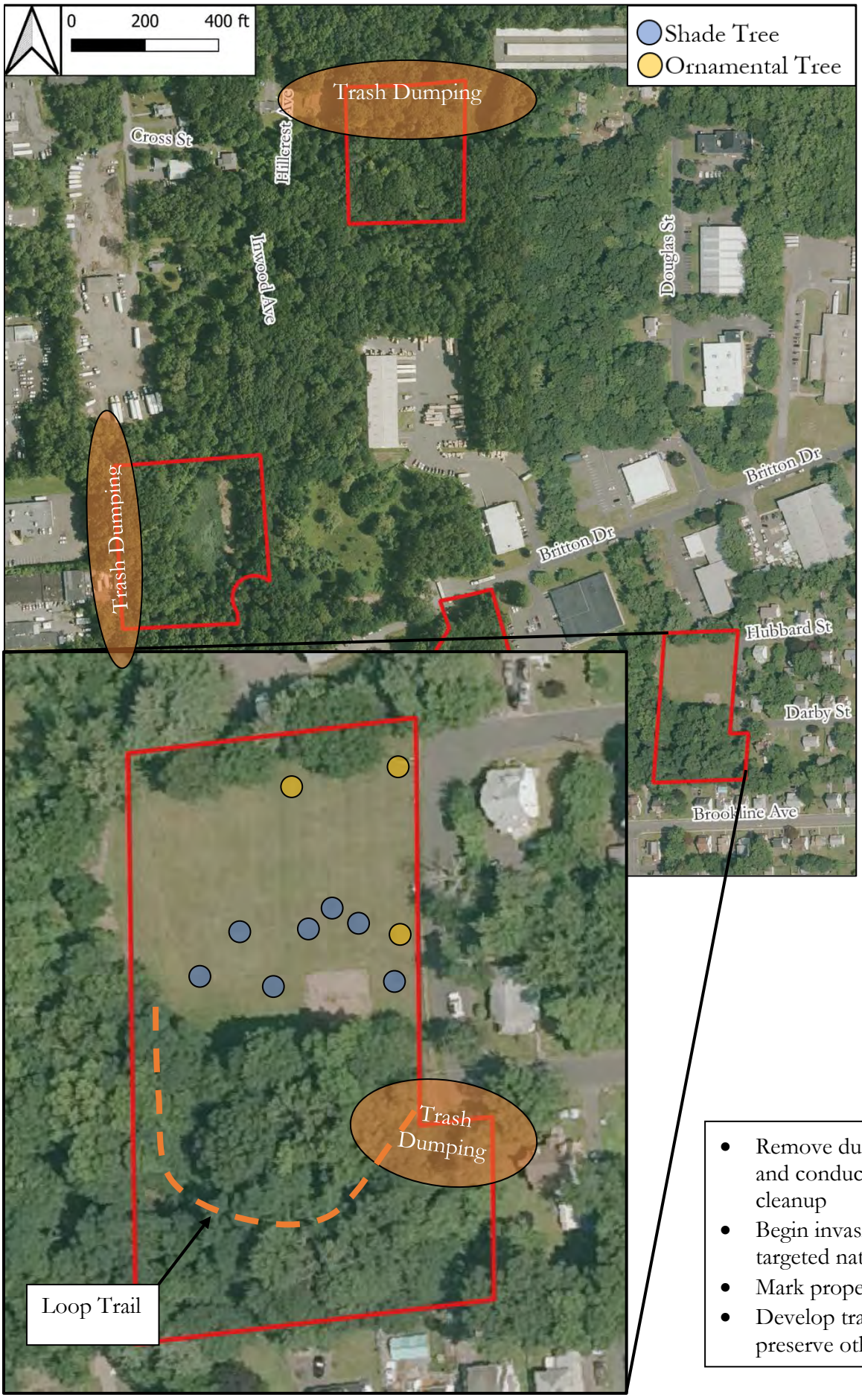
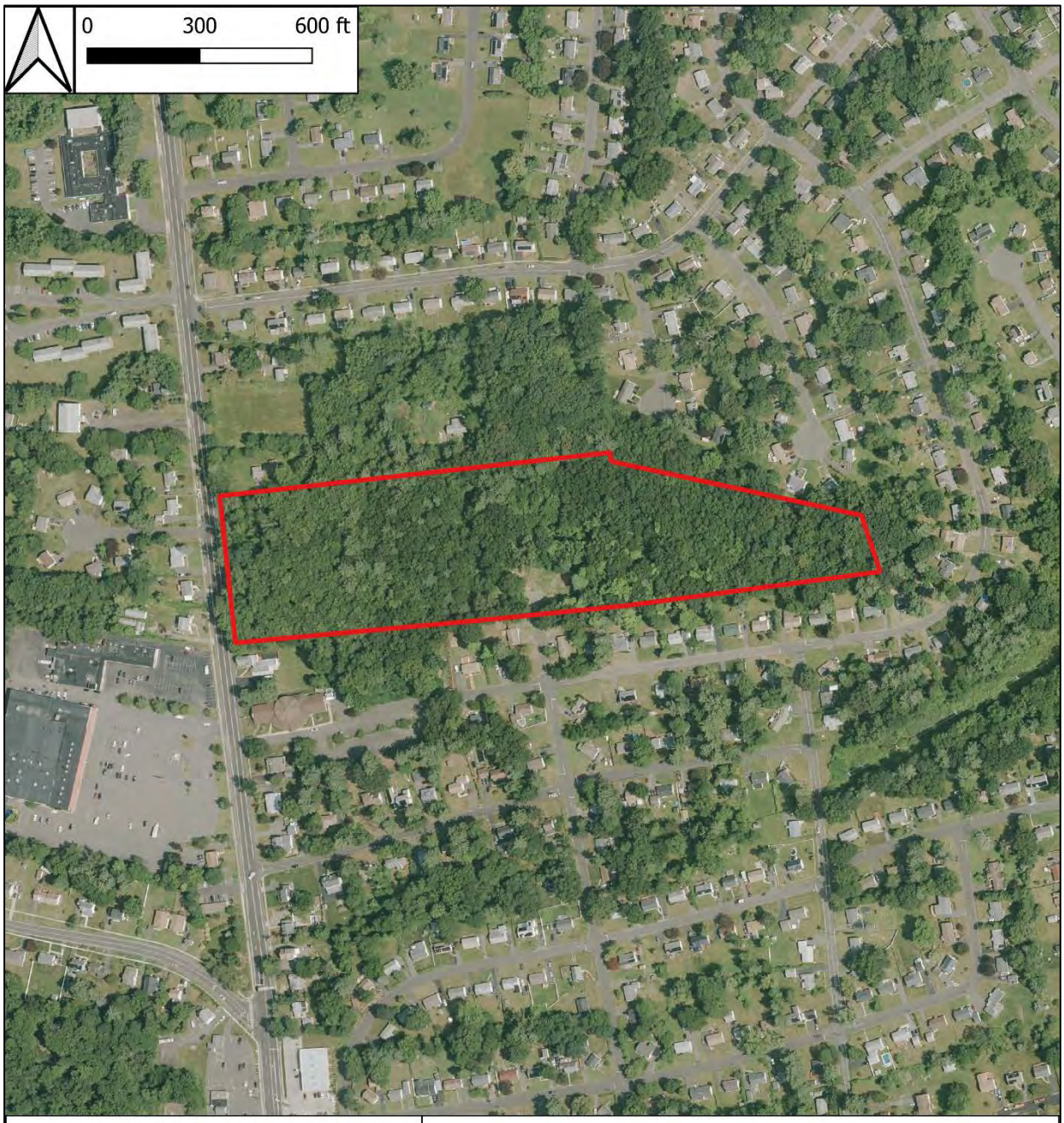


- Remove dumped materials and conduct visual boundary cleanup
- Begin invasive removal and targeted native planting
- Mark property boundaries
- Develop trail loop and preserve other parcels

Joyce Street Park



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Joyce Street Park

Bloomfield, CT

67 Joyce St, Bloomfield, CT 06002

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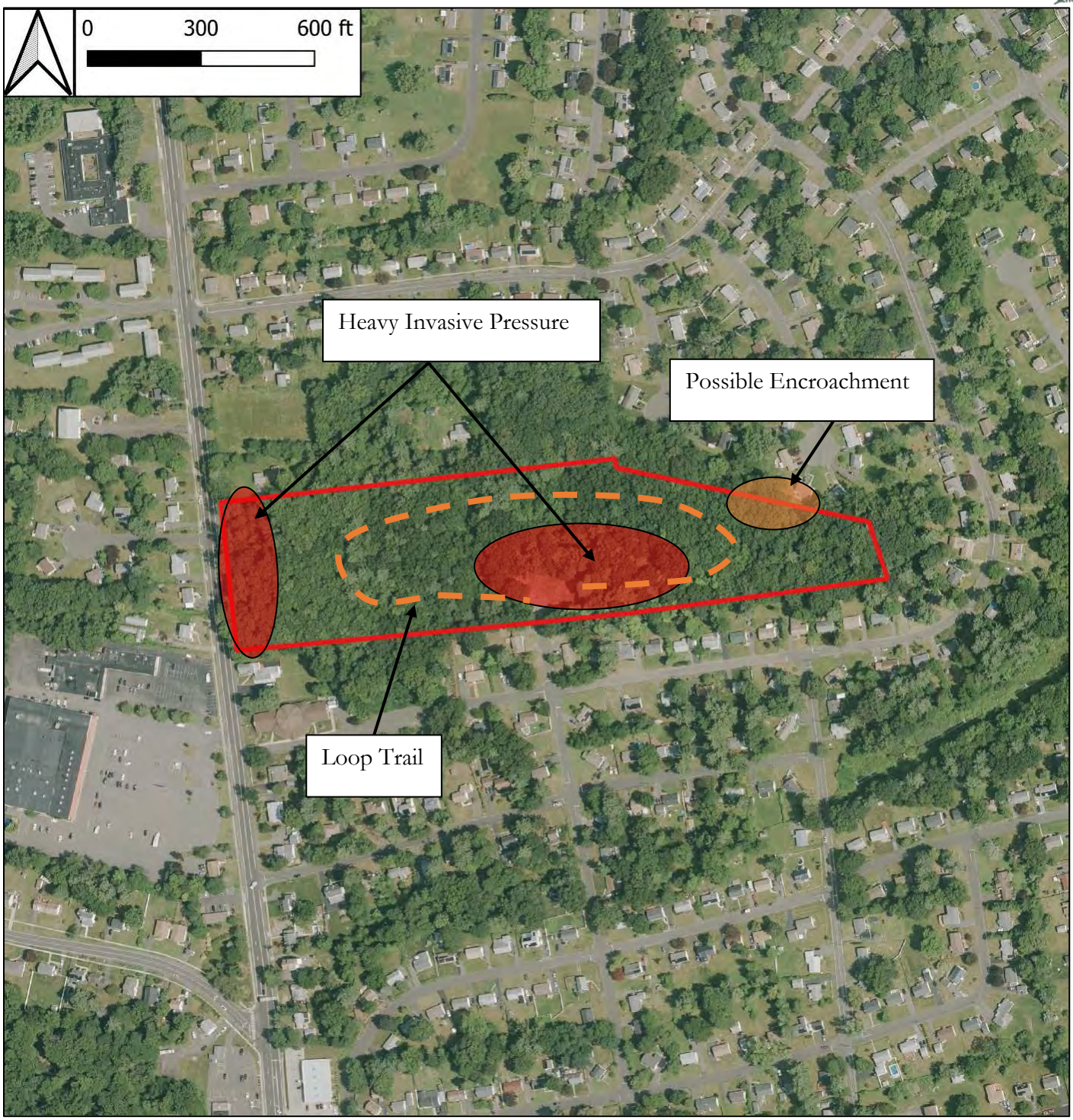
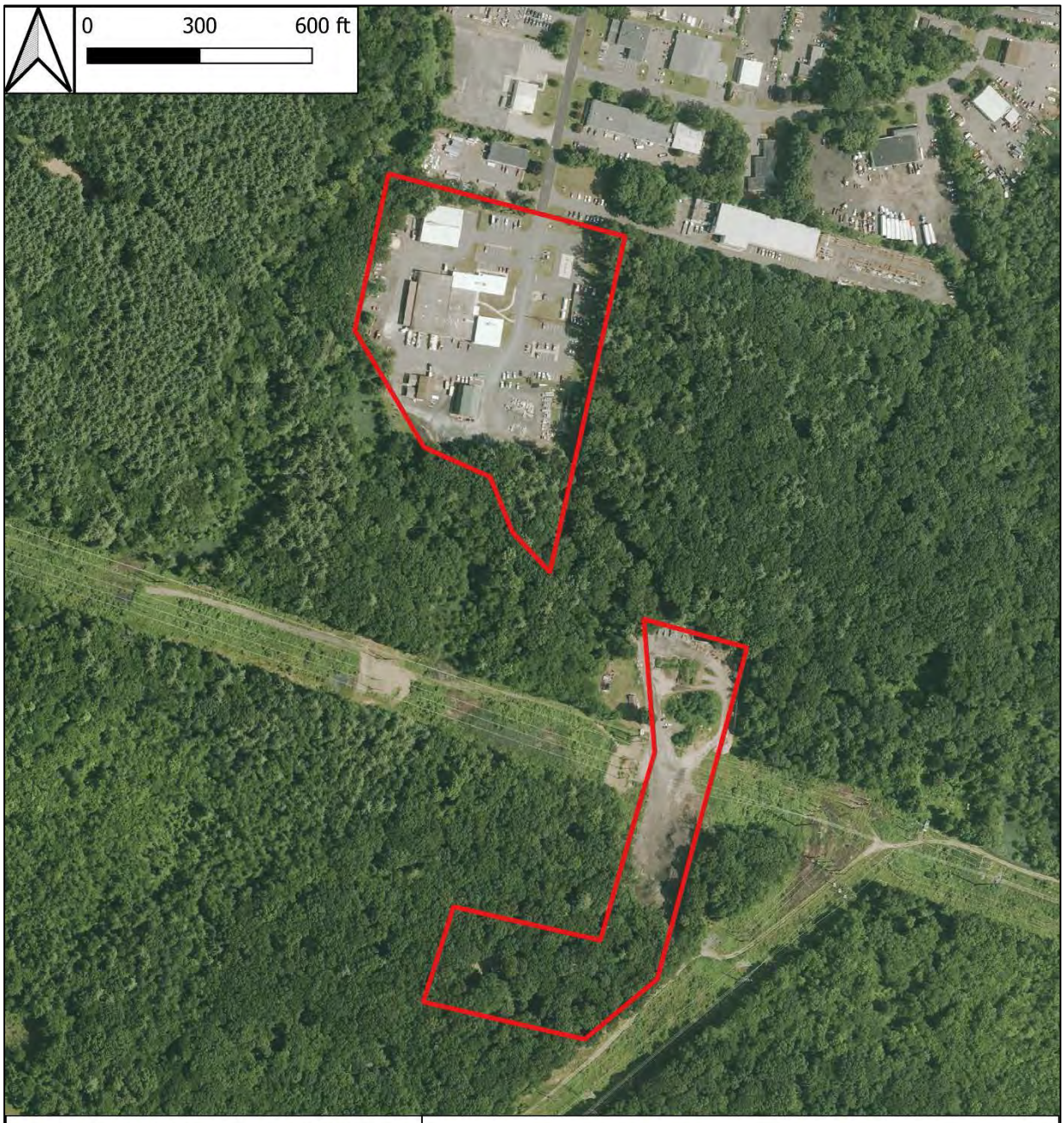


- Organize a community event to remove trash and control invasive species.
- Invasive control targeting burning bush, bittersweet, honeysuckle, etc.
- Mark property boundaries
- Install trail loop with educational signage



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Public Works

Bloomfield, CT

21 Southwood Dr, Bloomfield, CT 06002

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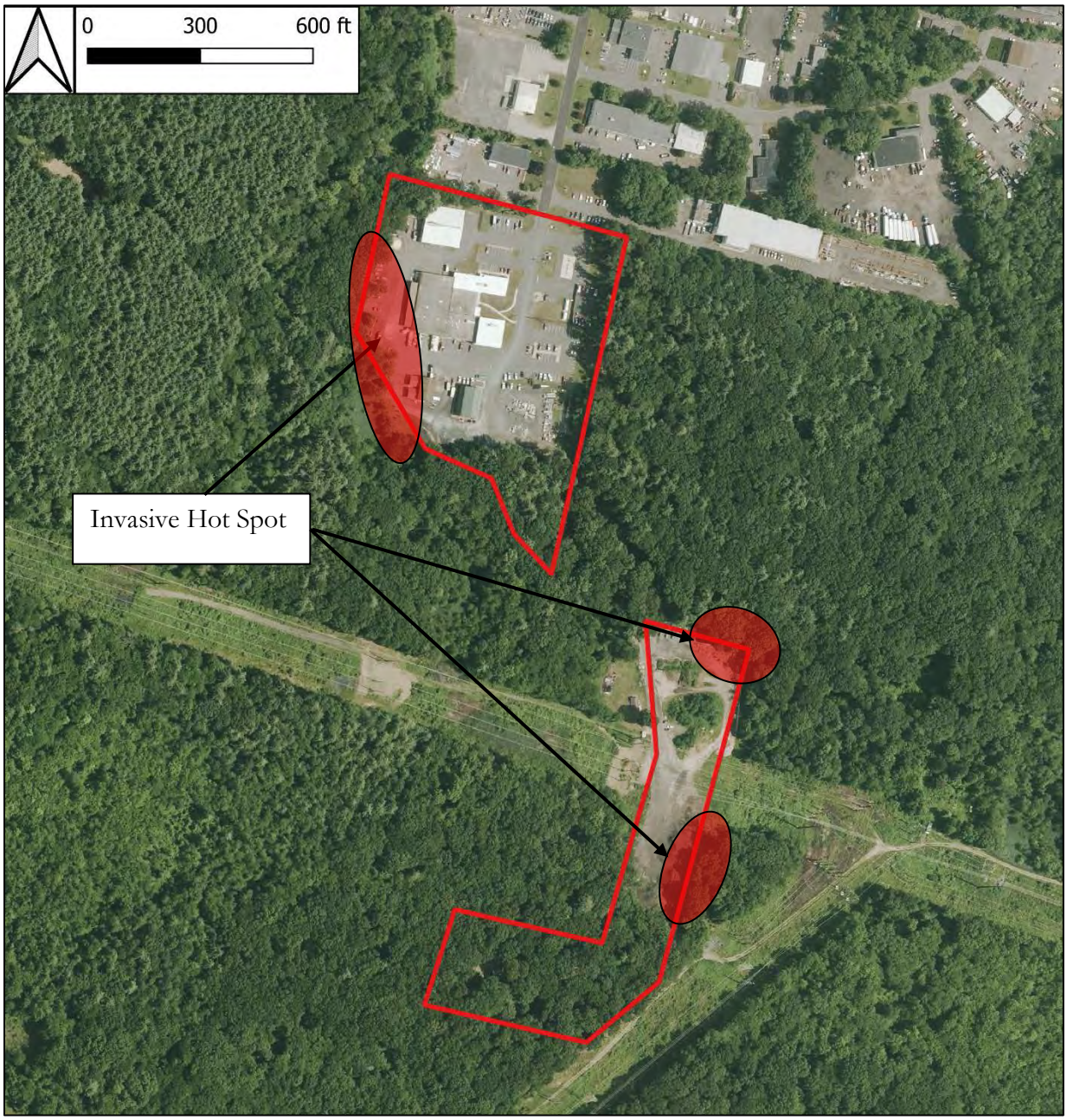
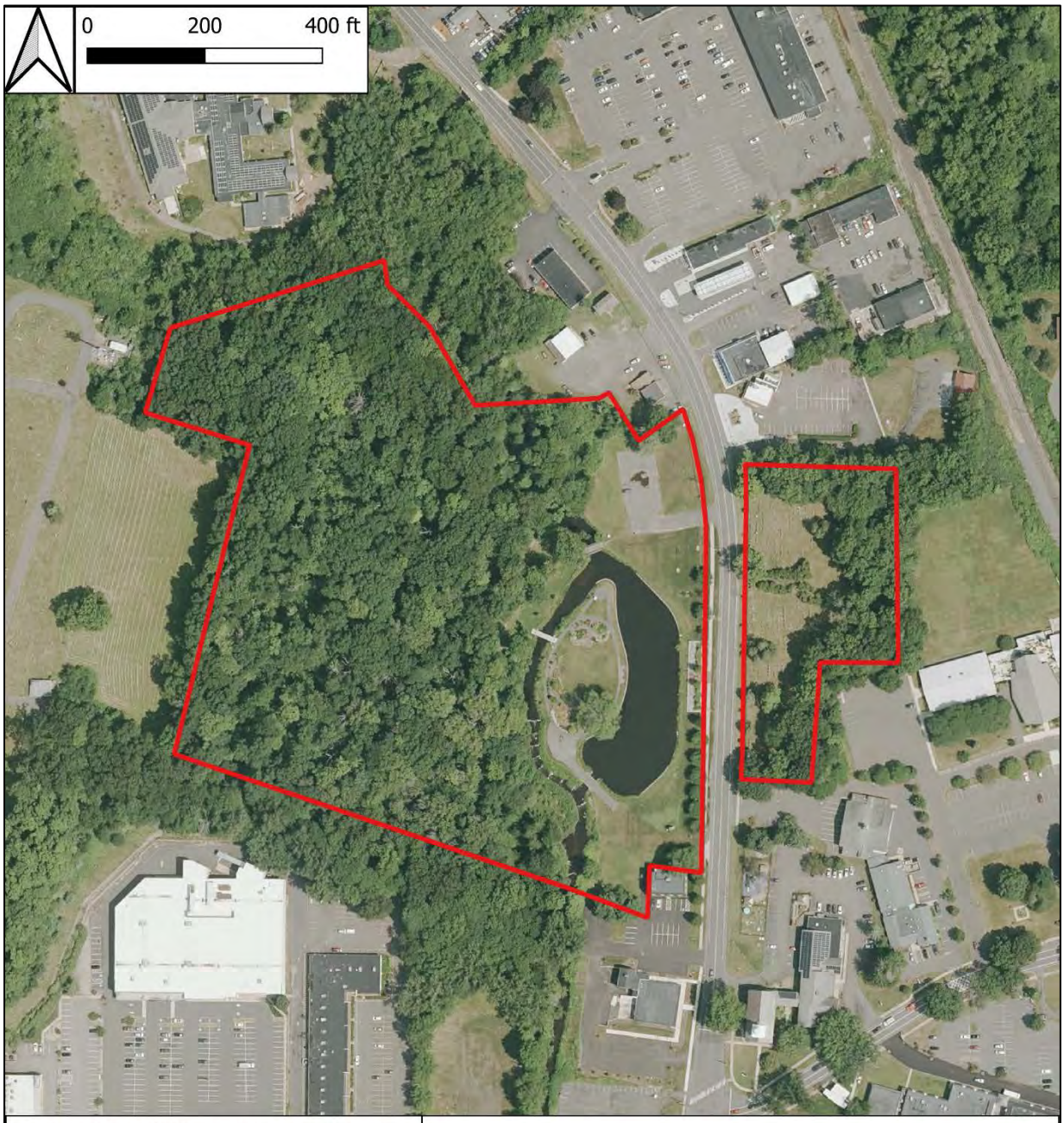


- Install mulch rings and deer guards
- Remove/prune encroaching vines or multiflora rose at edges



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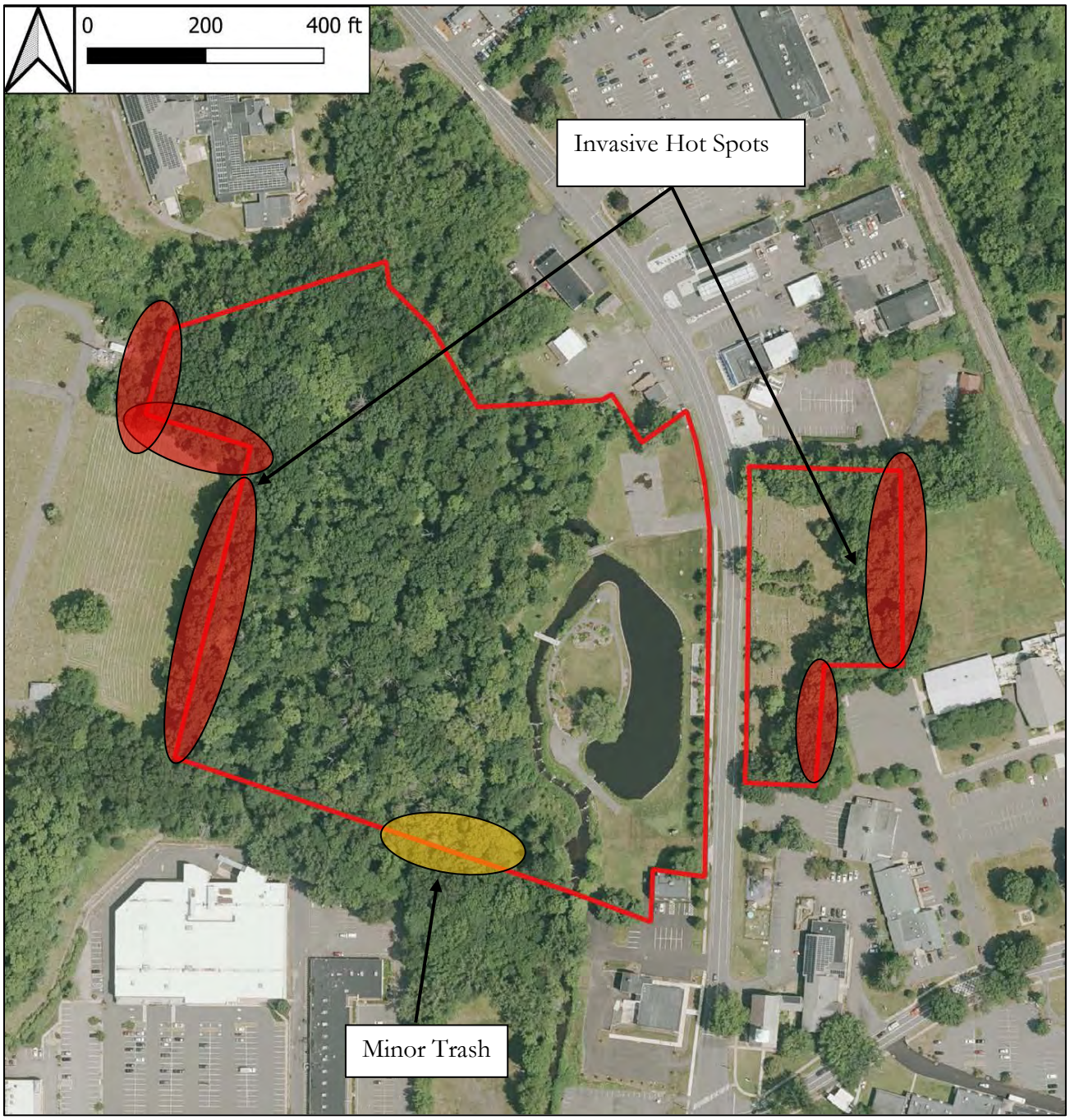
Filley Park

Bloomfield, CT

33 Tunxis Ave, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

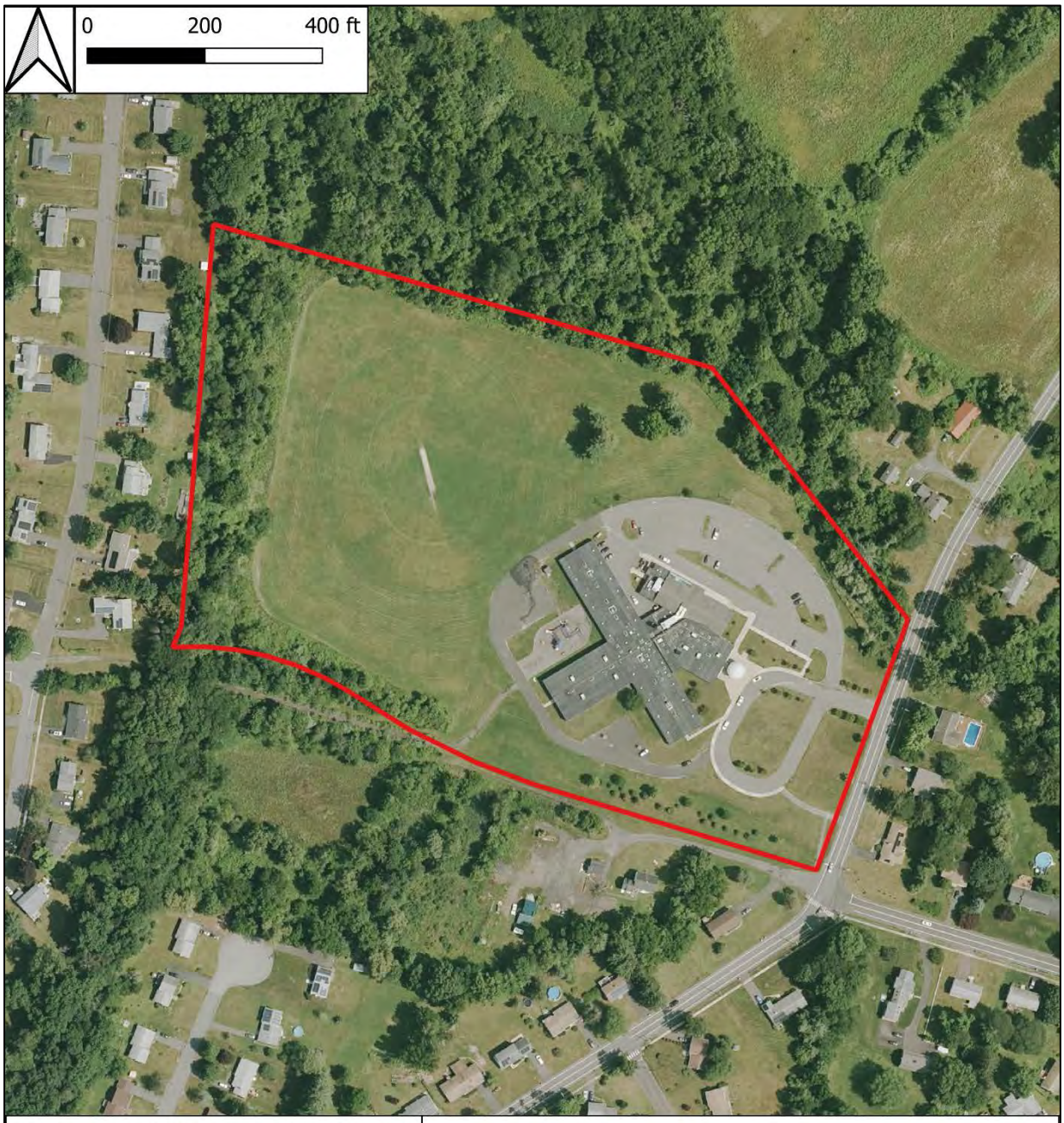
PAGE **1**



- Invasive removal at cemetery edges, culverts, grocery fence
- Correct improper tree plantings
- Plant native hardwoods and monitor tree health

Trail Map

Laurel School



BASE LAYER: AERIAL IMAGERY IS FROM BING 2020. BOUNDARY AND STAND LINES WERE CREATED BY CONNWOOD FORESTERS FOR PLANNING PURPOSES ONLY. NO DATA IN THIS DRAWING IS TO BE CONSIDERED SURVEY GRADE.

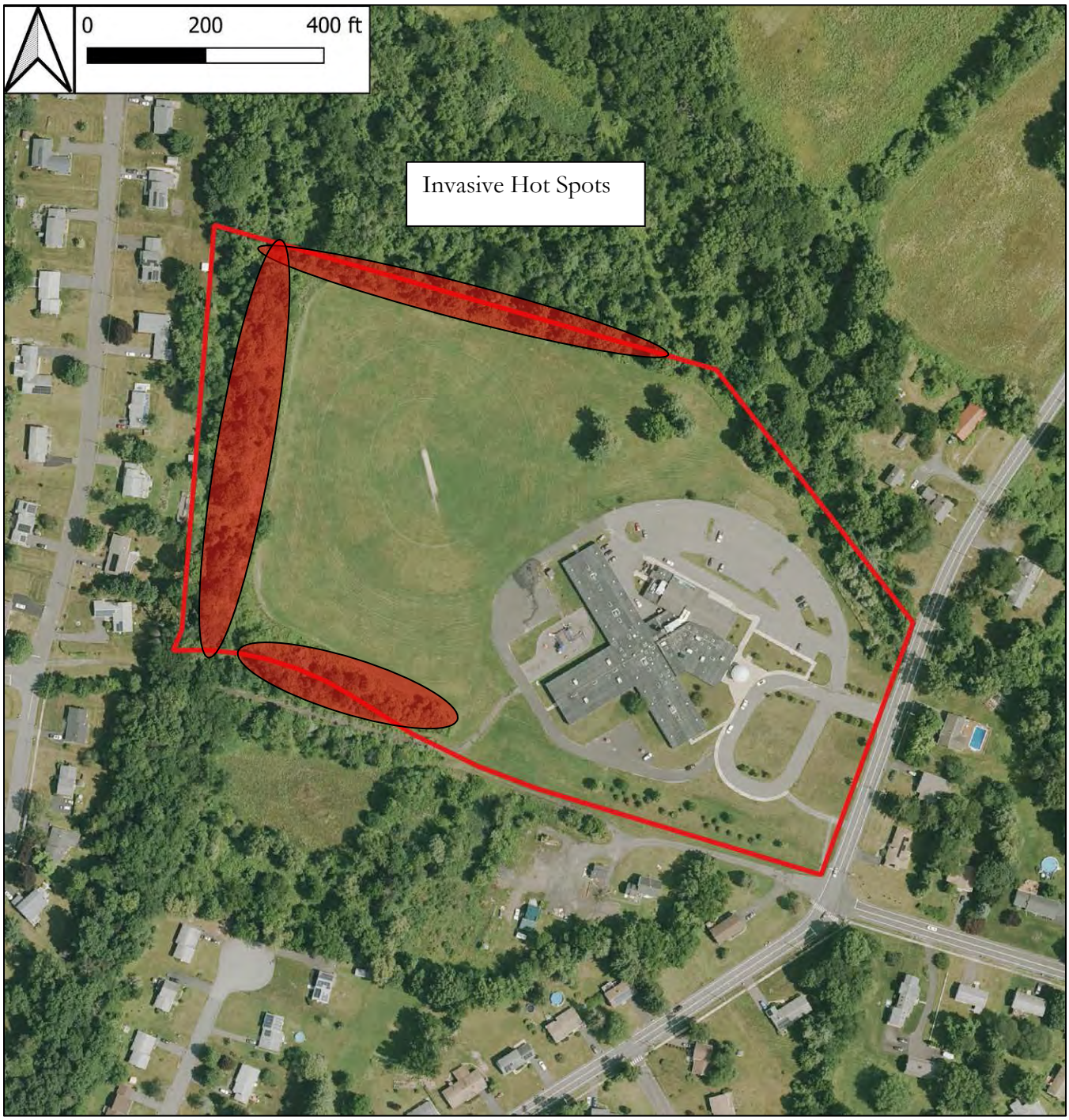
Laurel School

Bloomfield, CT

1 Filley St, Bloomfield, CT 06002

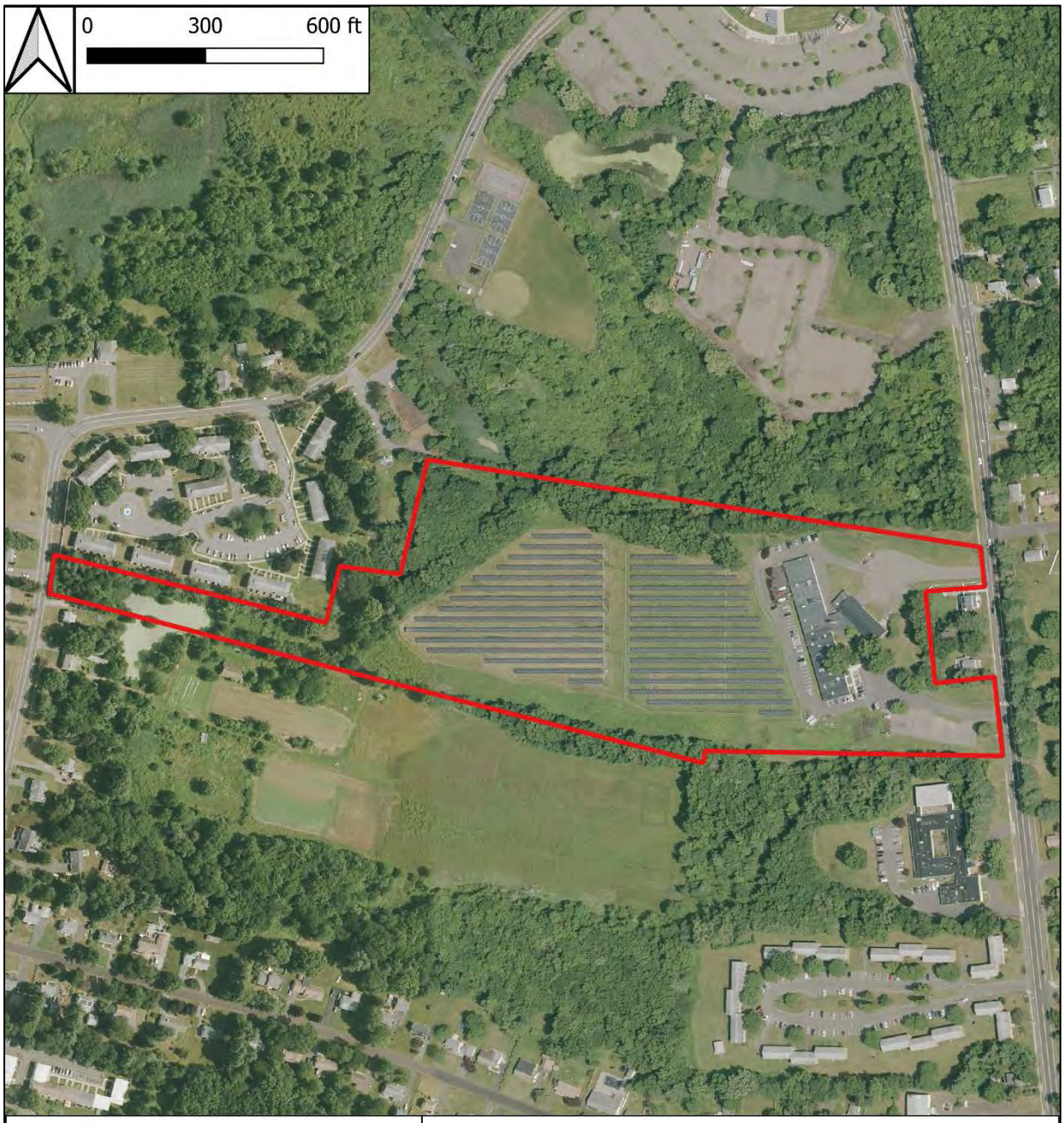
CONNWOOD FORESTERS, INC.

PAGE **1**



- Stabilize slopes with deep-rooted native shrubs
- Repair fences and discourage dumping
- Target vines on slopes

Board of Education



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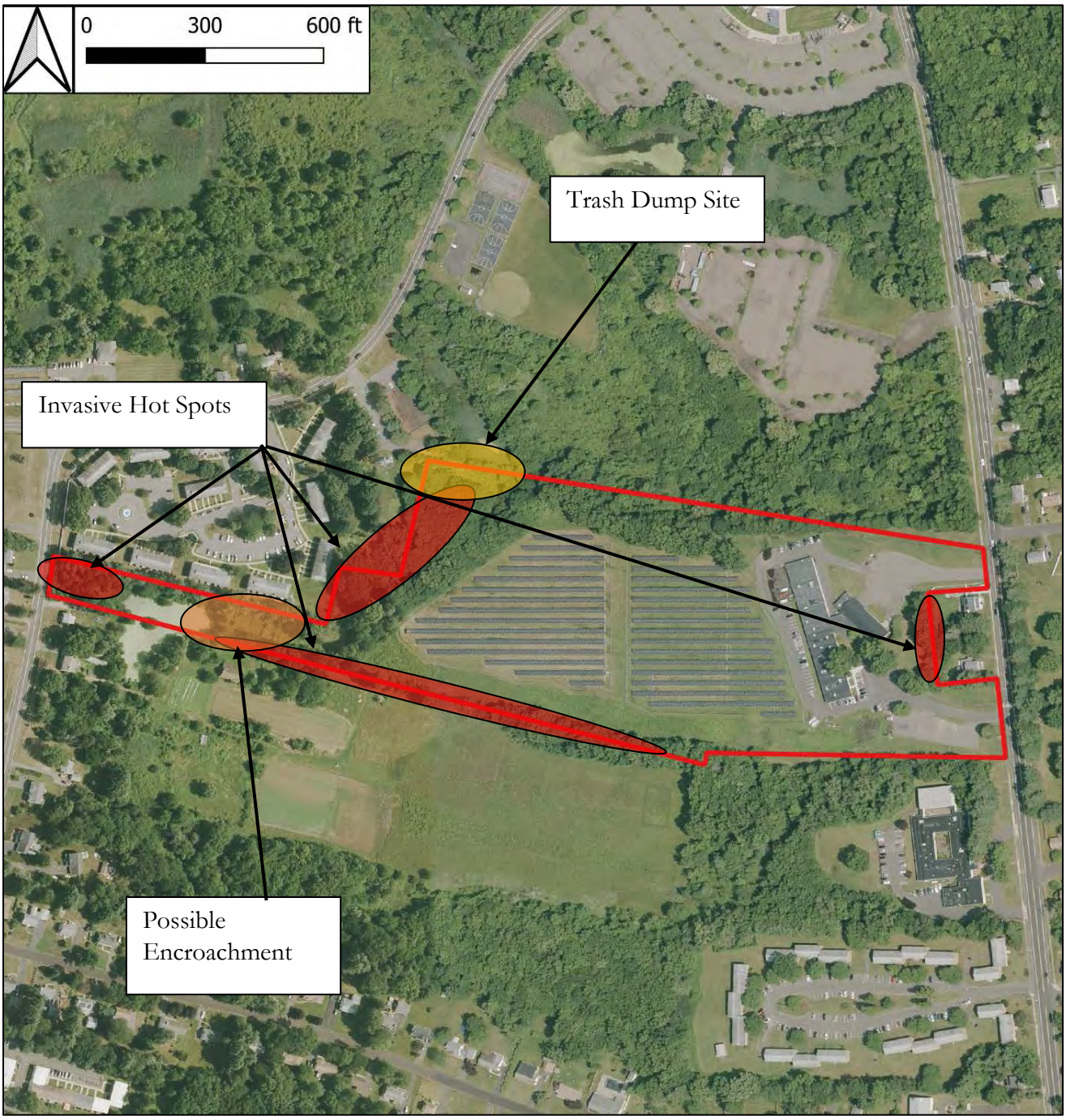
Board of Education

Bloomfield, CT

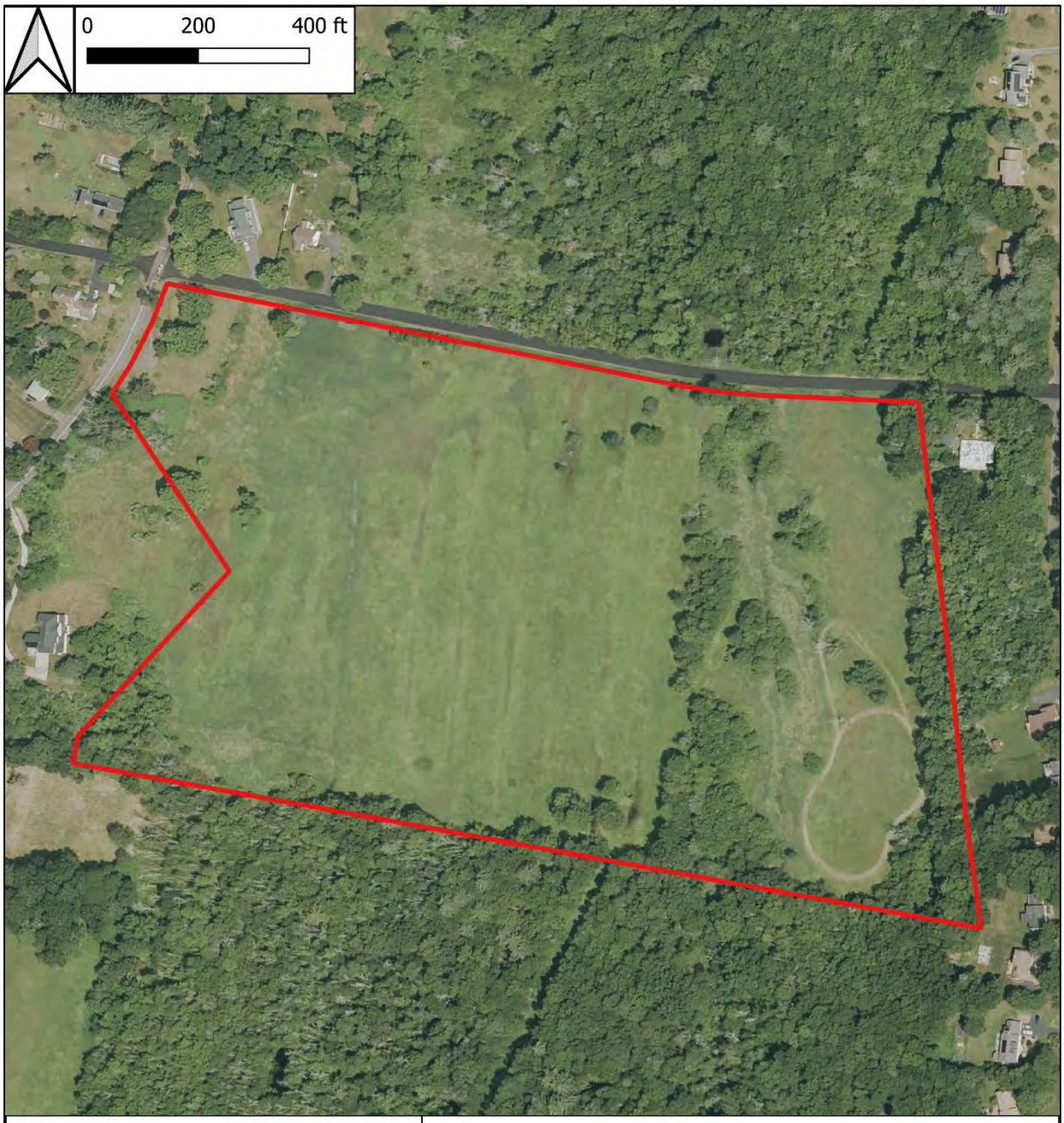
1133 Blue Hills Ave, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

PAGE **1**



- Clean dump sites and remove large debris
- Monitor and lightly manage natural regeneration
- Control vines and invasives at fence lines



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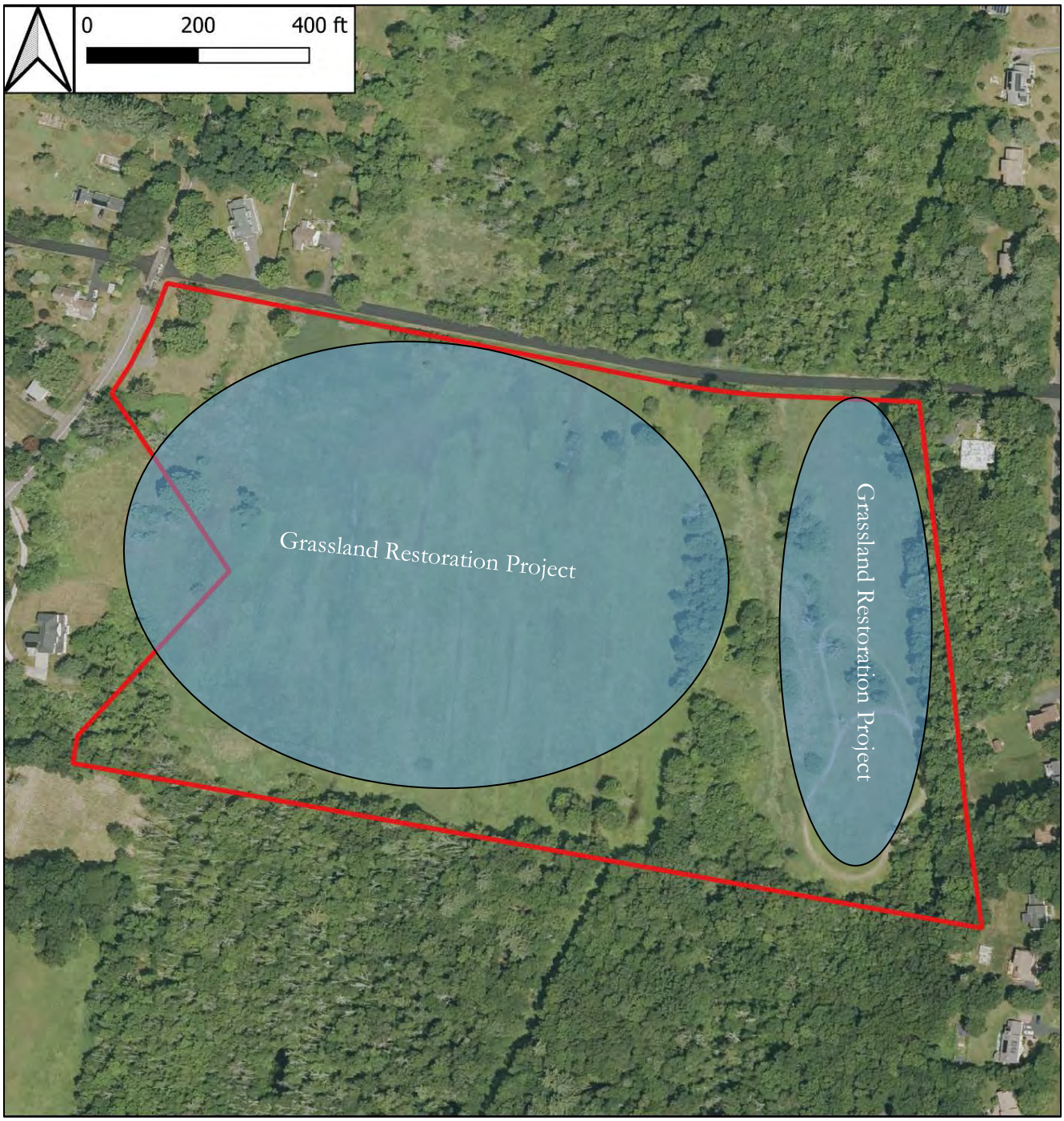
Vista Gardens

Bloomfield, CT

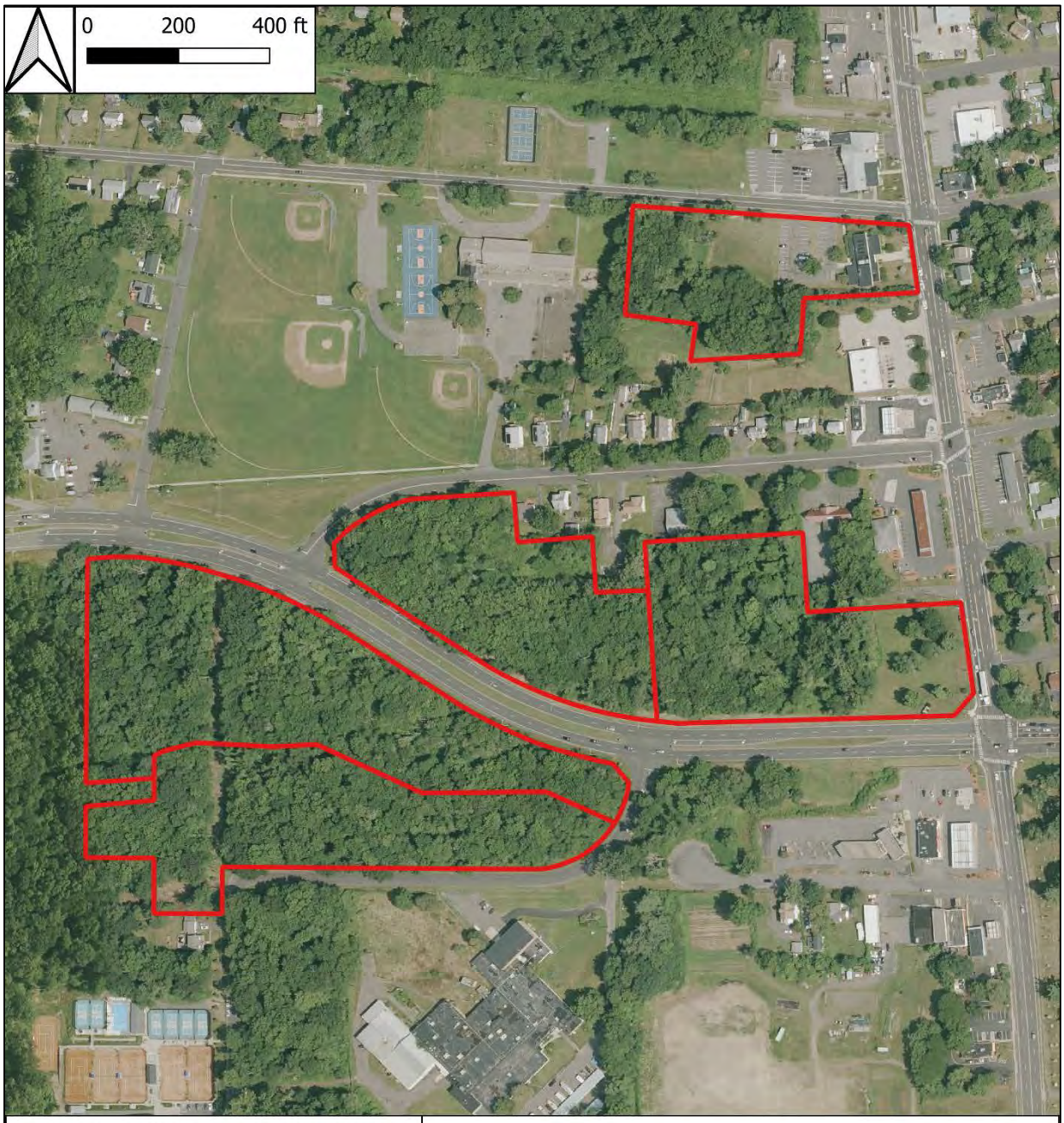
177-129 Duncaster Rd, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

PAGE **1**



- Remove or cut back invasive vines near edges and open grown trees
- Mark property boundaries
- Investigate grassland restoration projects



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Rockwell Park

Bloomfield, CT

73 Rockwell Ave, Bloomfield, CT 06002

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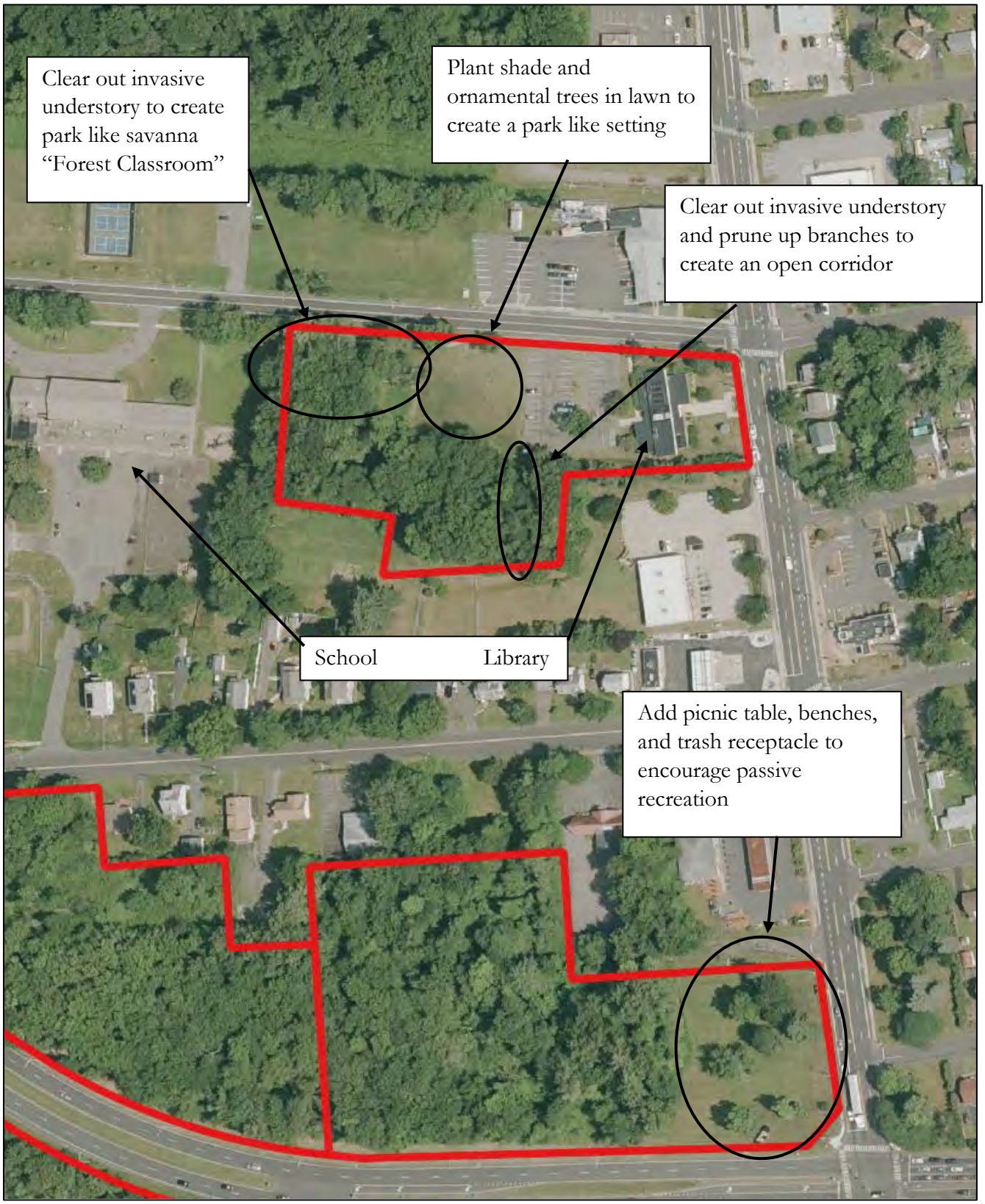
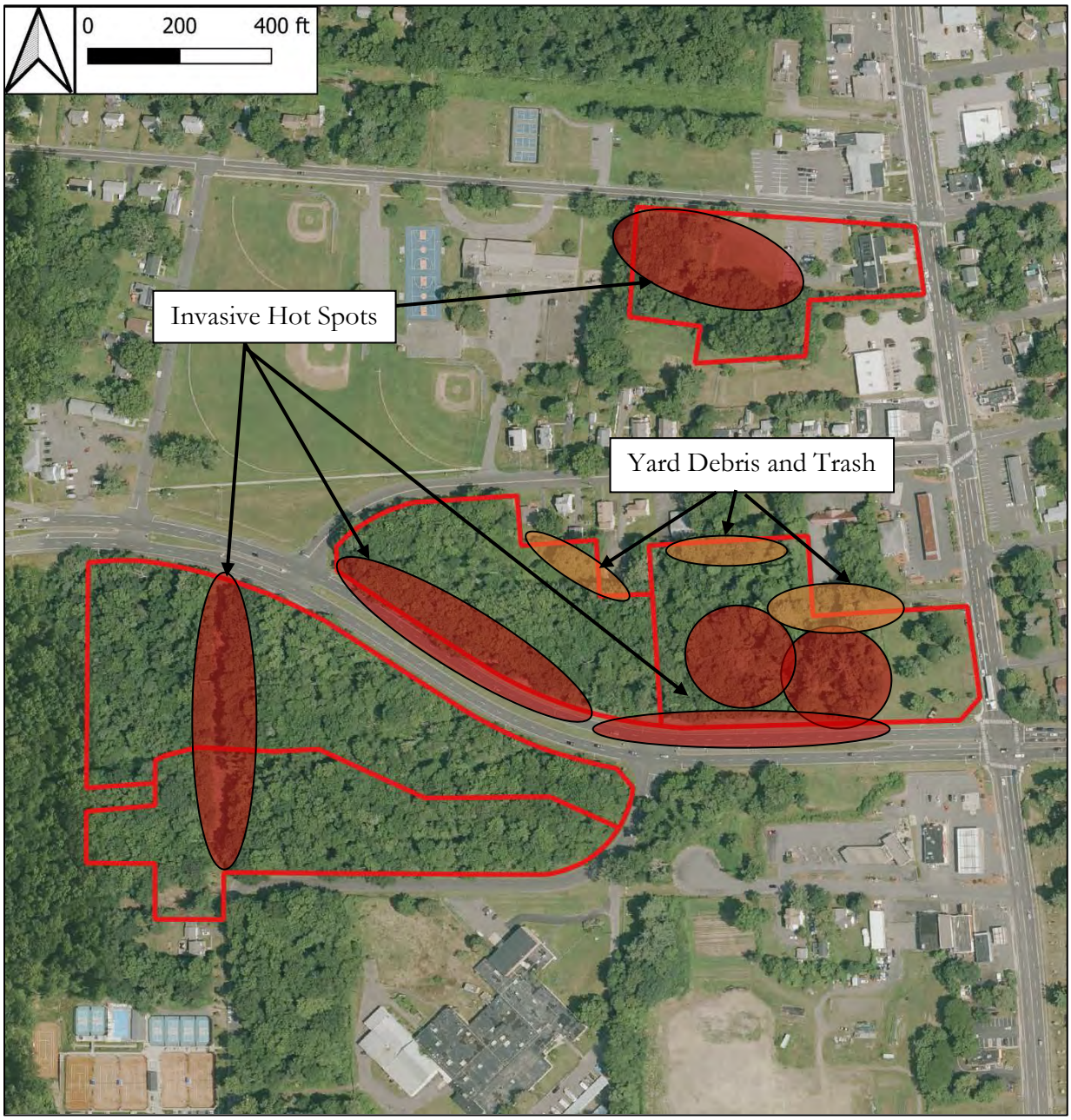
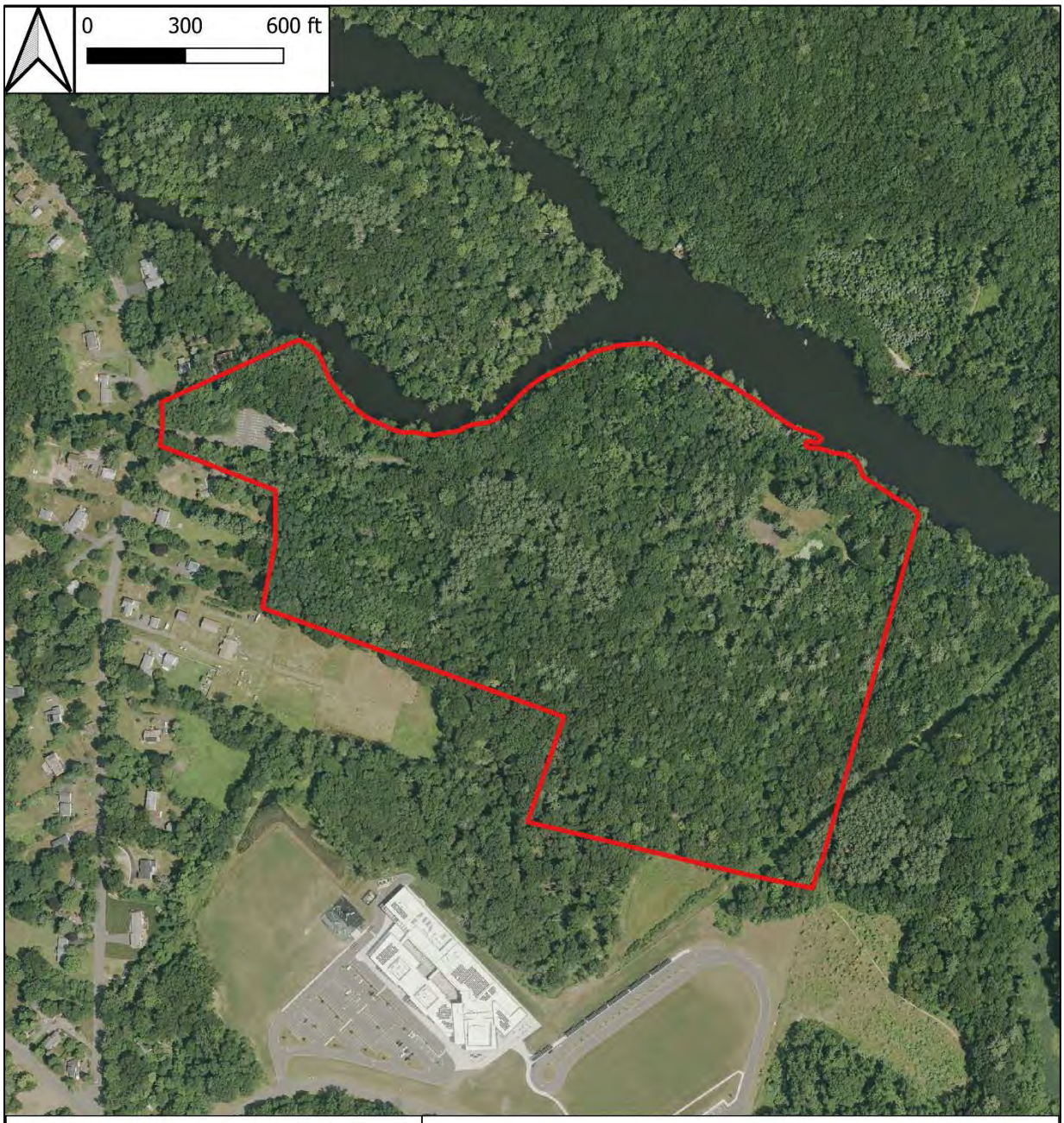
PAGE **1**



- Organize a community event to remove trash and control invasive species.
- Target bittersweet and invasives on the forest edge
- Mark property boundaries
- Investigate the possibility of creating a forest classroom in the northern most parcel.


0
200
400 ft
Invasive Hot Spots
Yard Debris and Trash



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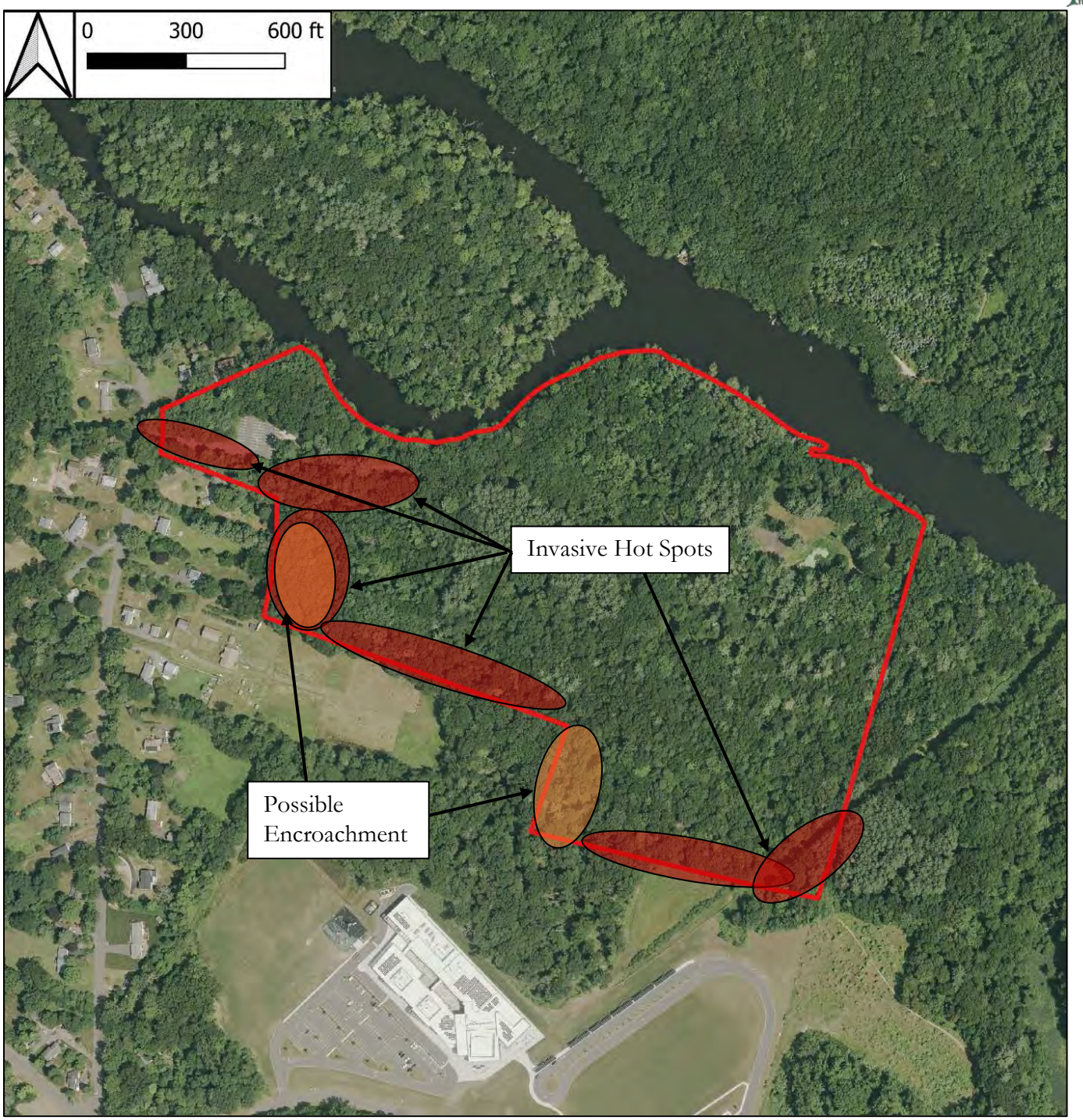
Farmington River Park

Bloomfield, CT

458 Tunxis Ave, Bloomfield, CT 06002

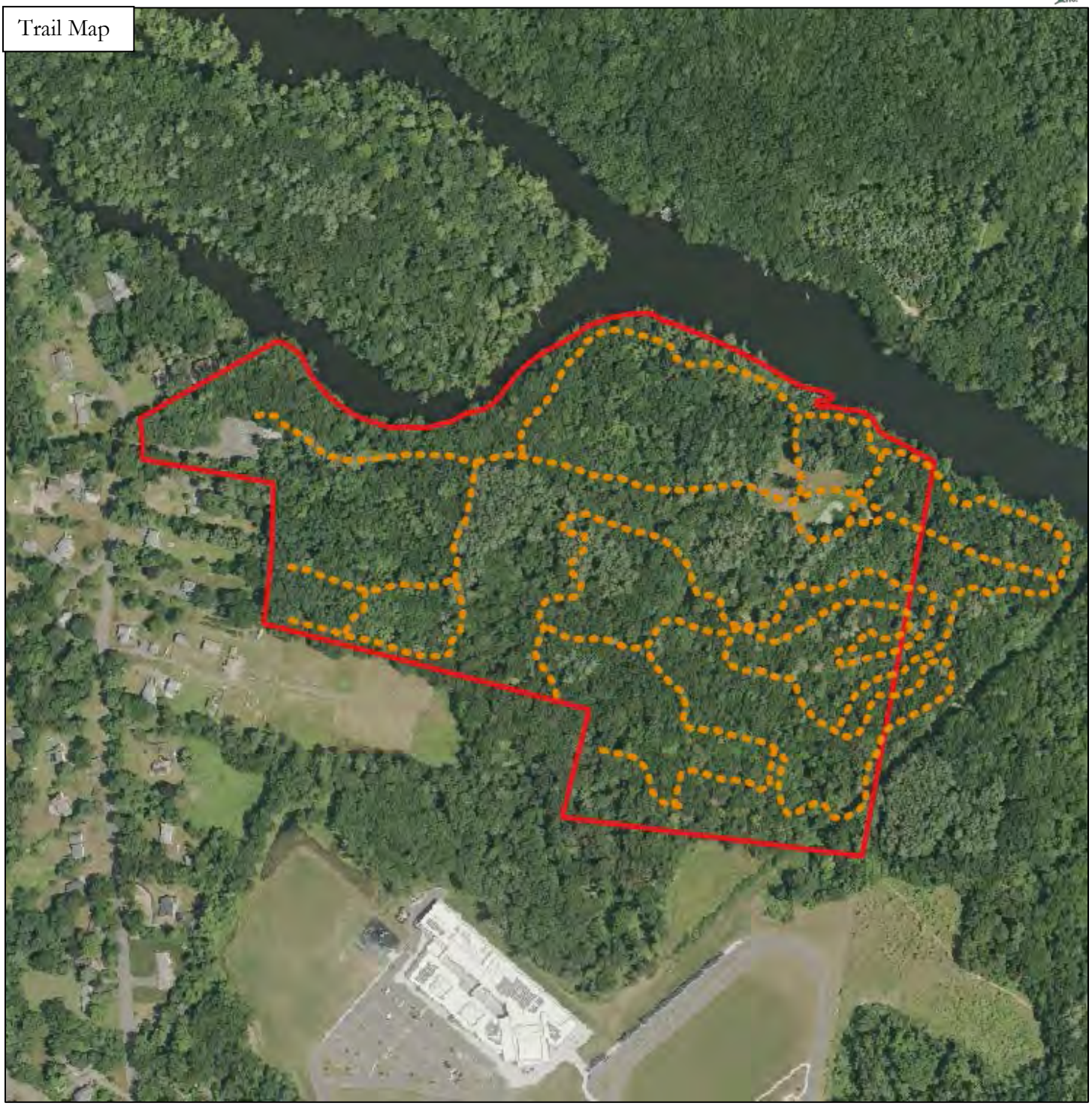
CONNWOOD FORESTERS, INC.

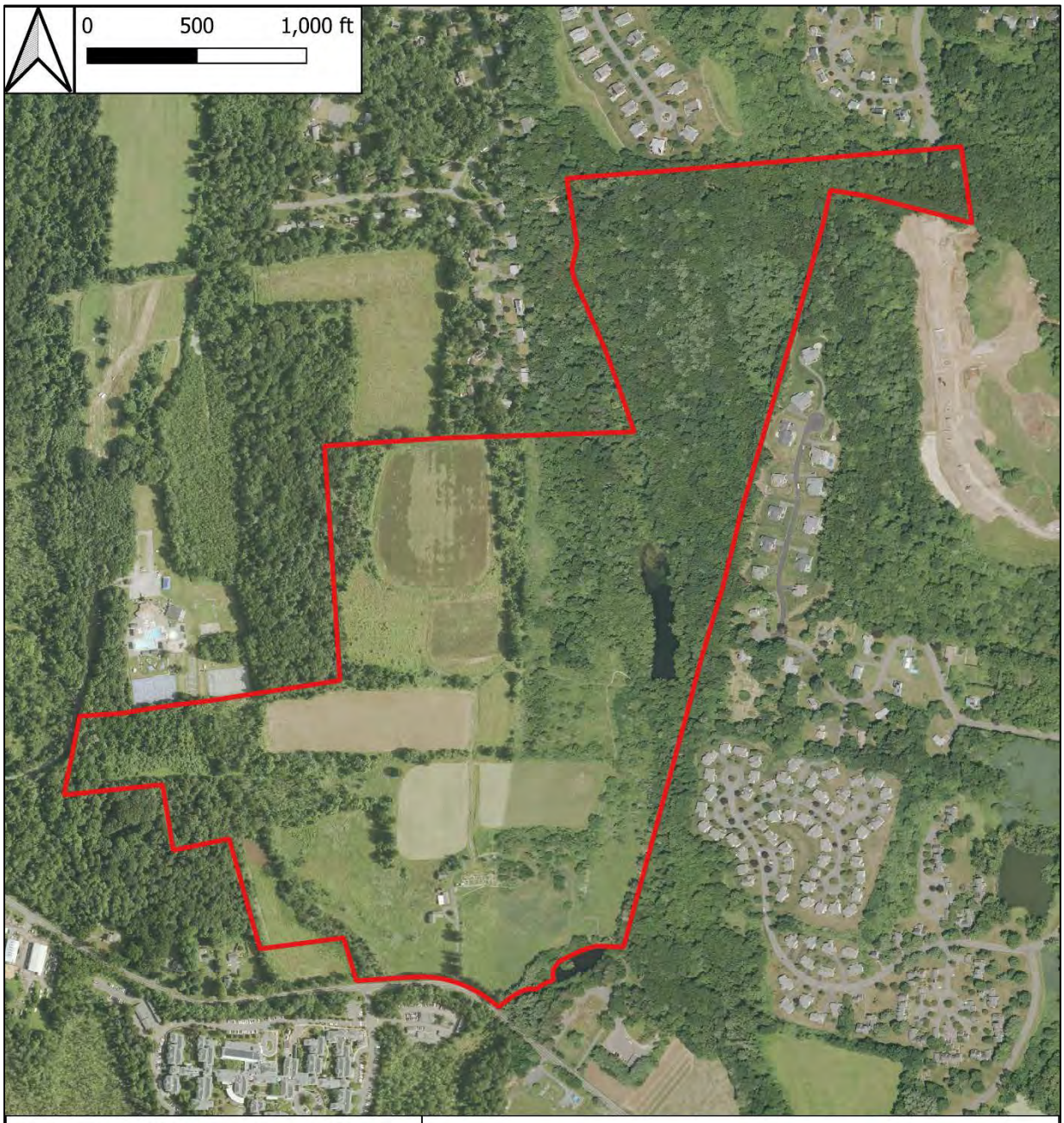
PAGE **1**



- Organize a community event to remove trash and control invasive species.
- Protect canopy trees from vines
- Engage stakeholders to clarify use and discourage dumping
- Inventory snags and monitor regeneration
- Mark property boundaries

Trail Map





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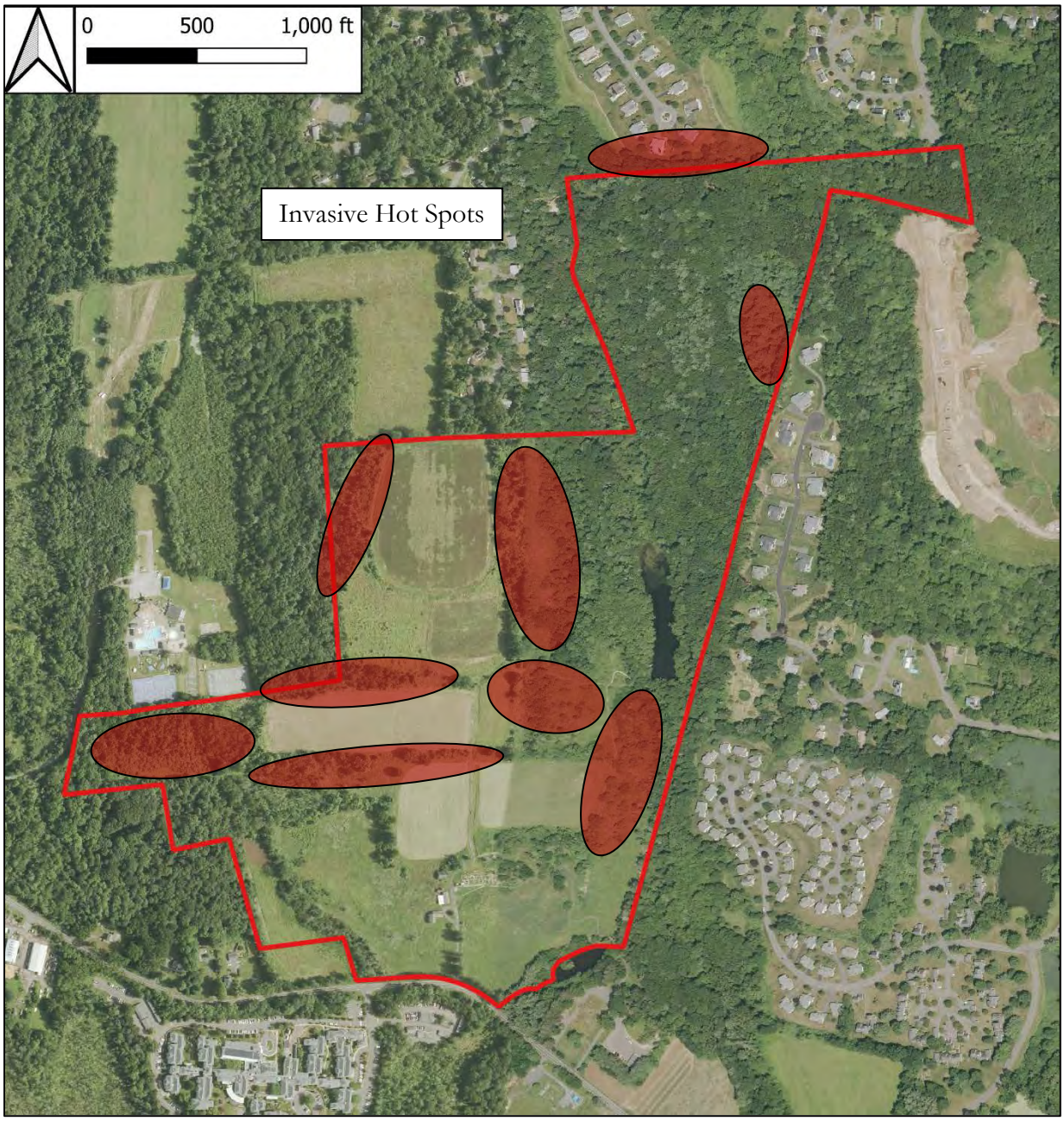
La Salette Park

Bloomfield, CT

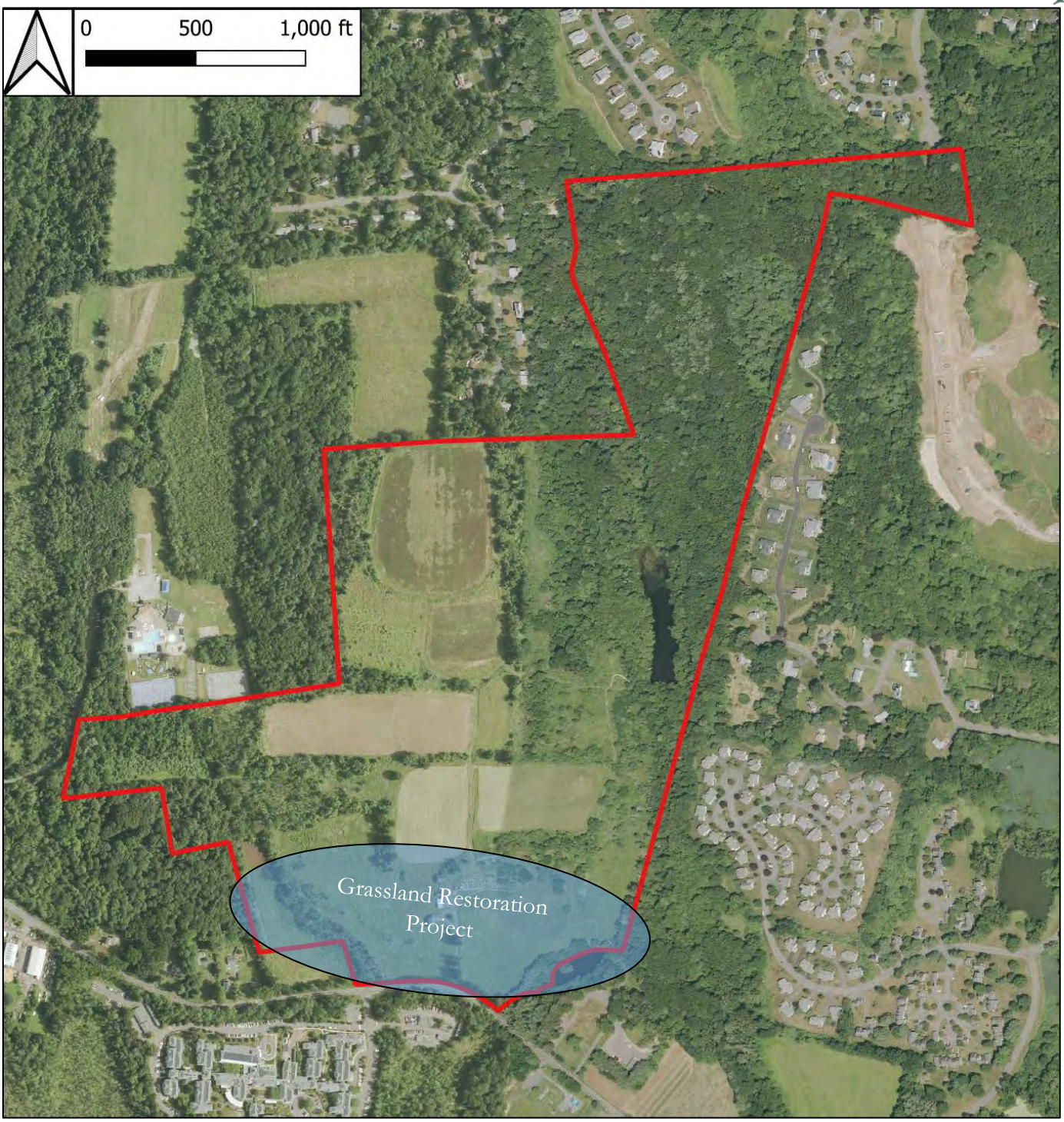
100-128 Mountain Ave, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

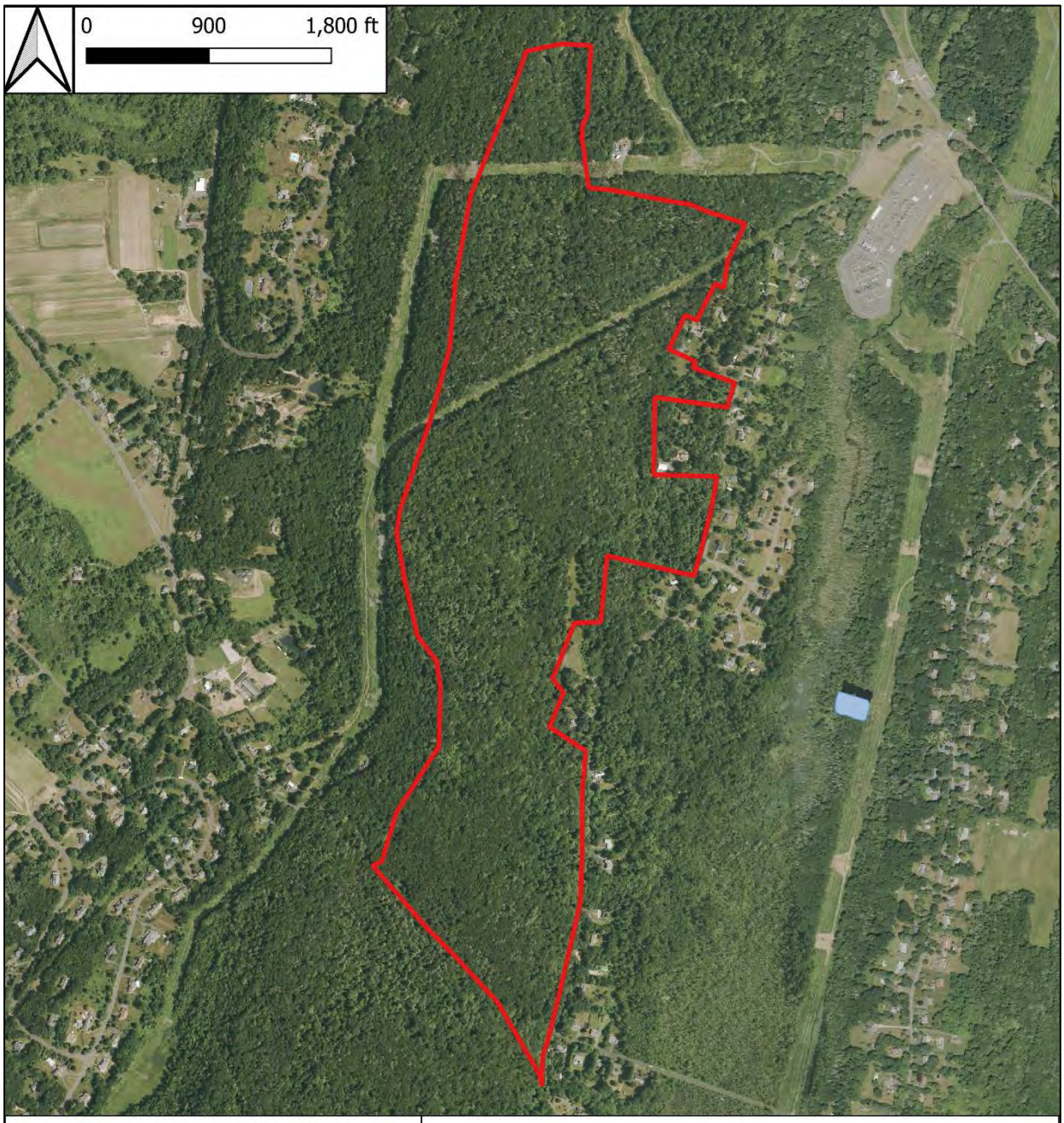
PAGE **1**



- Organize a community event to remove trash and control invasive species.
- Free regeneration from vines
- Implement rotational invasive control and replant gaps
- Mark property boundaries
- Investigate grassland restoration projects


0
500
1,000 ft
Grassland Restoration Project

Trail Map



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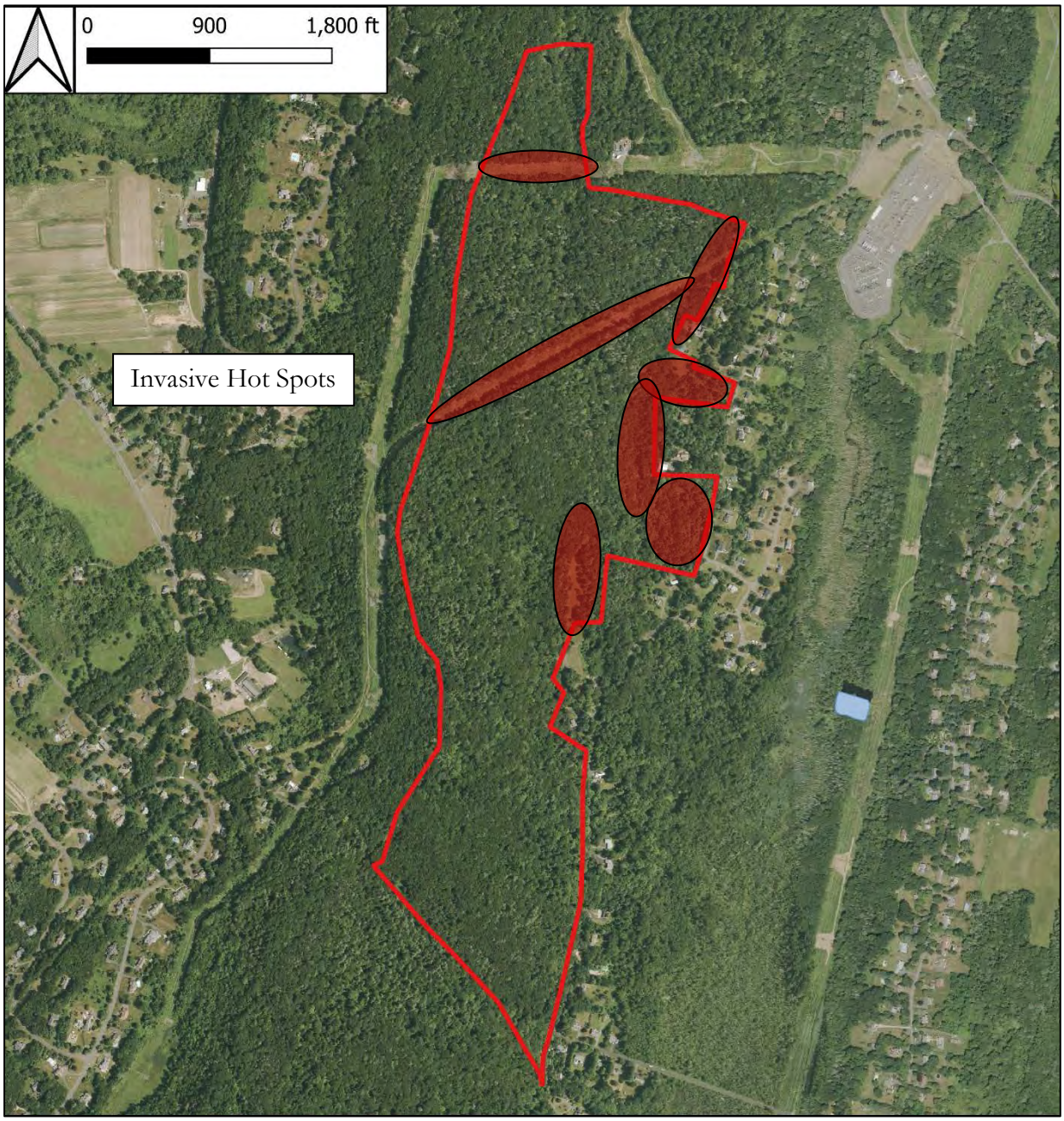
Wilcox Park

Bloomfield, CT

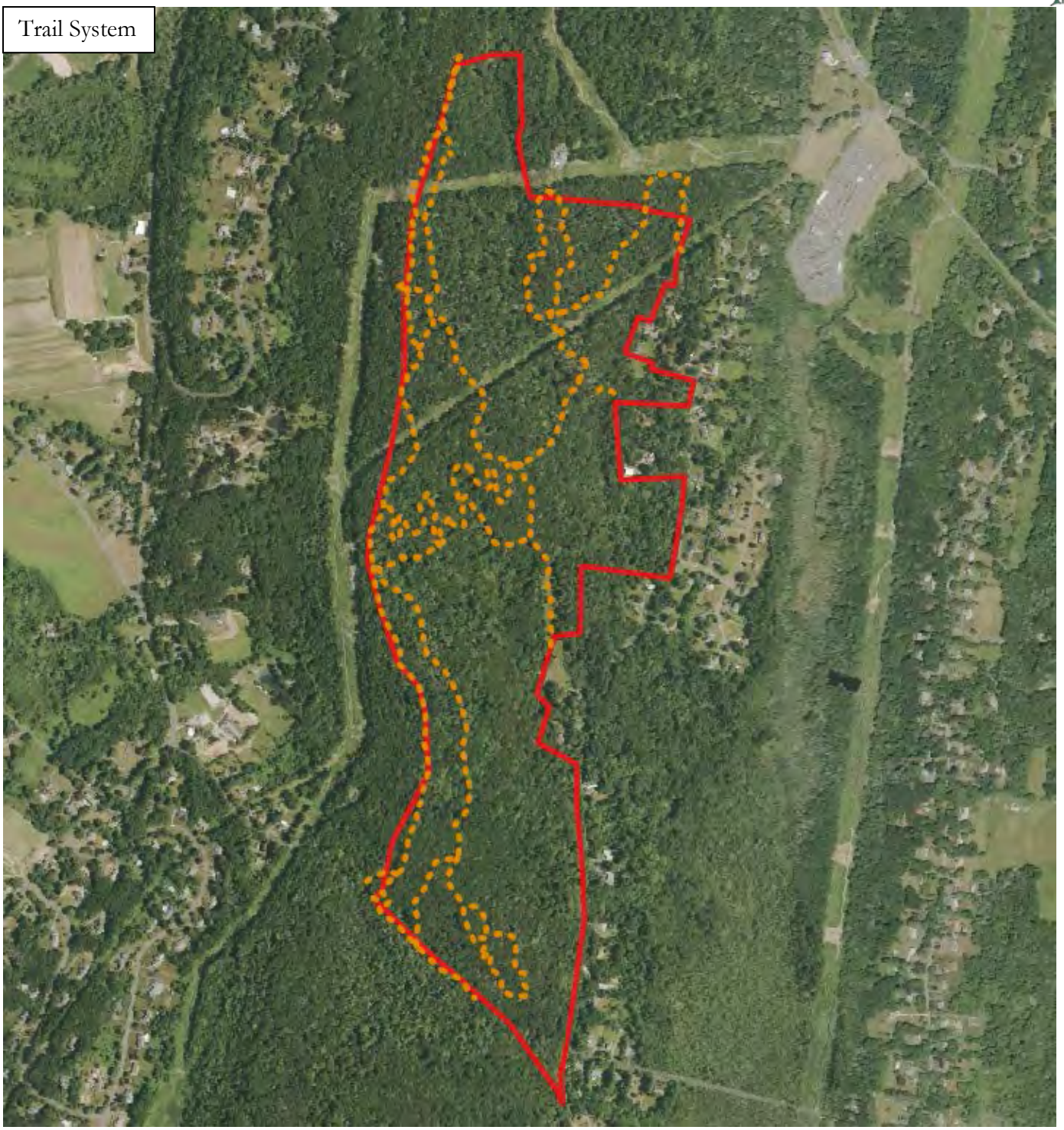
46 Hoskins Rd, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

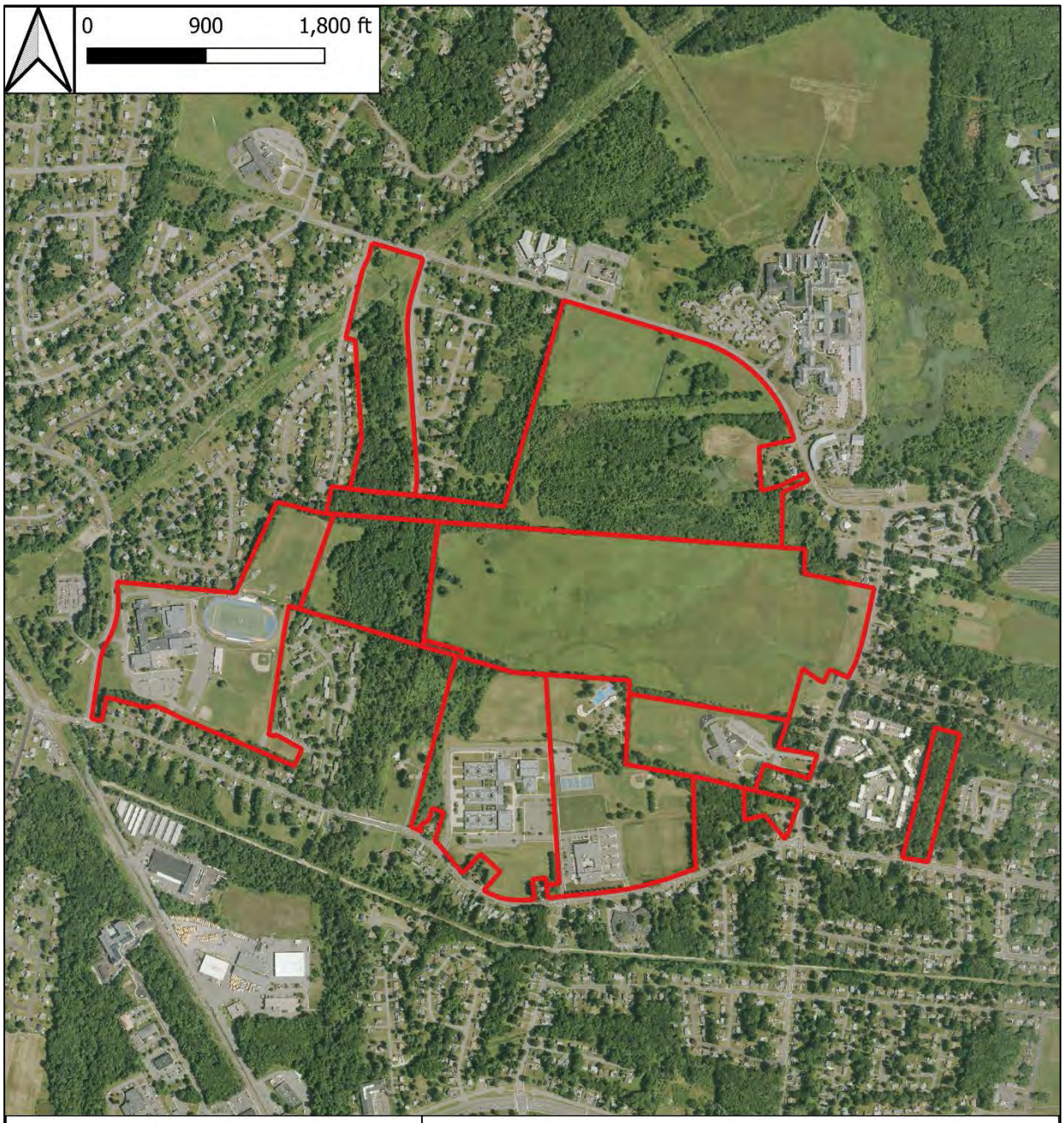
PAGE **1**



- Organize a community event to remove trash and control invasive species.
- Install educational signage
- Promote multi-age structure with selective thinning
- Mark property boundaries


Trail System

Samuel Wheeler Reed and School Complex



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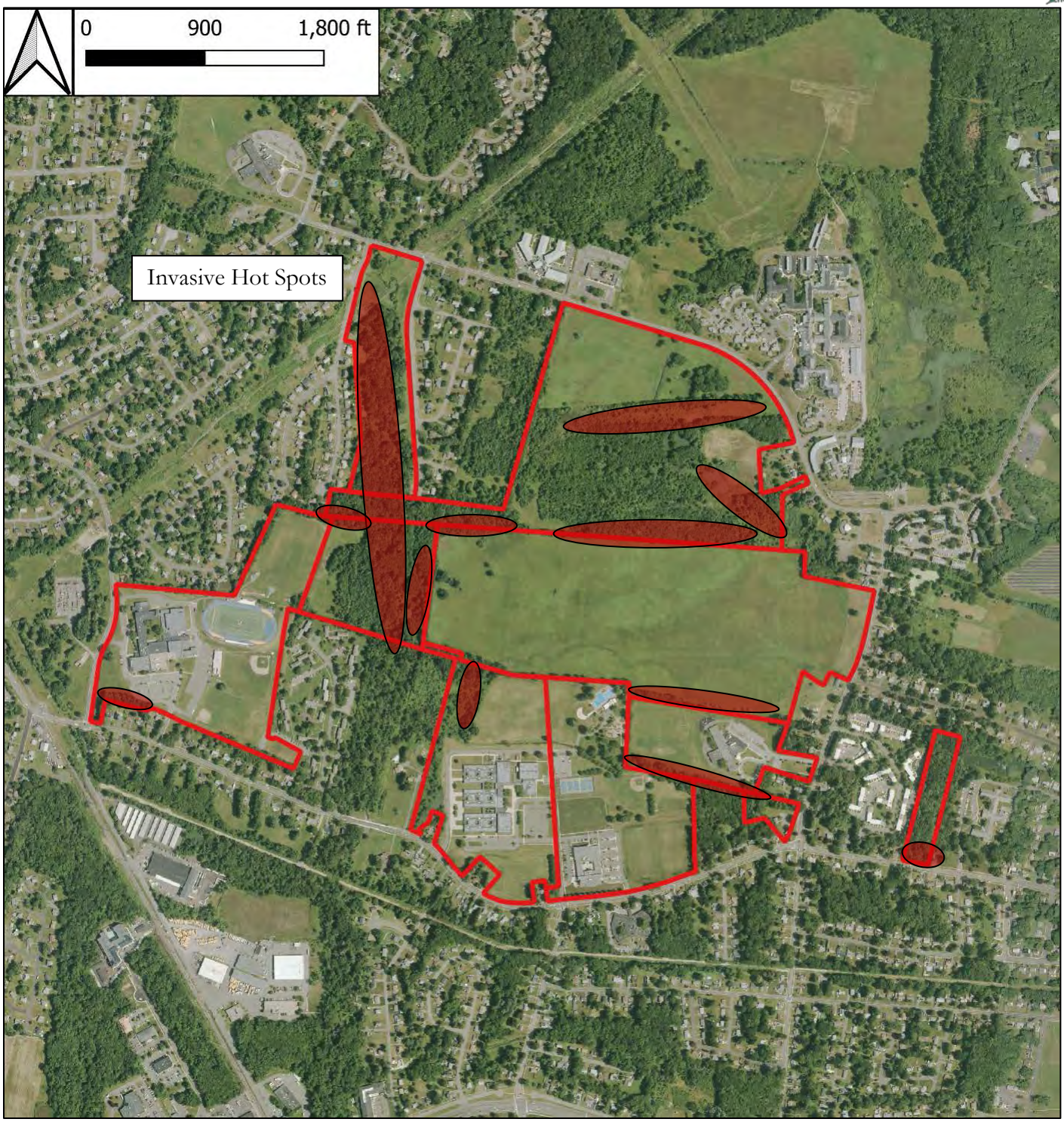
School Complex

Bloomfield, CT

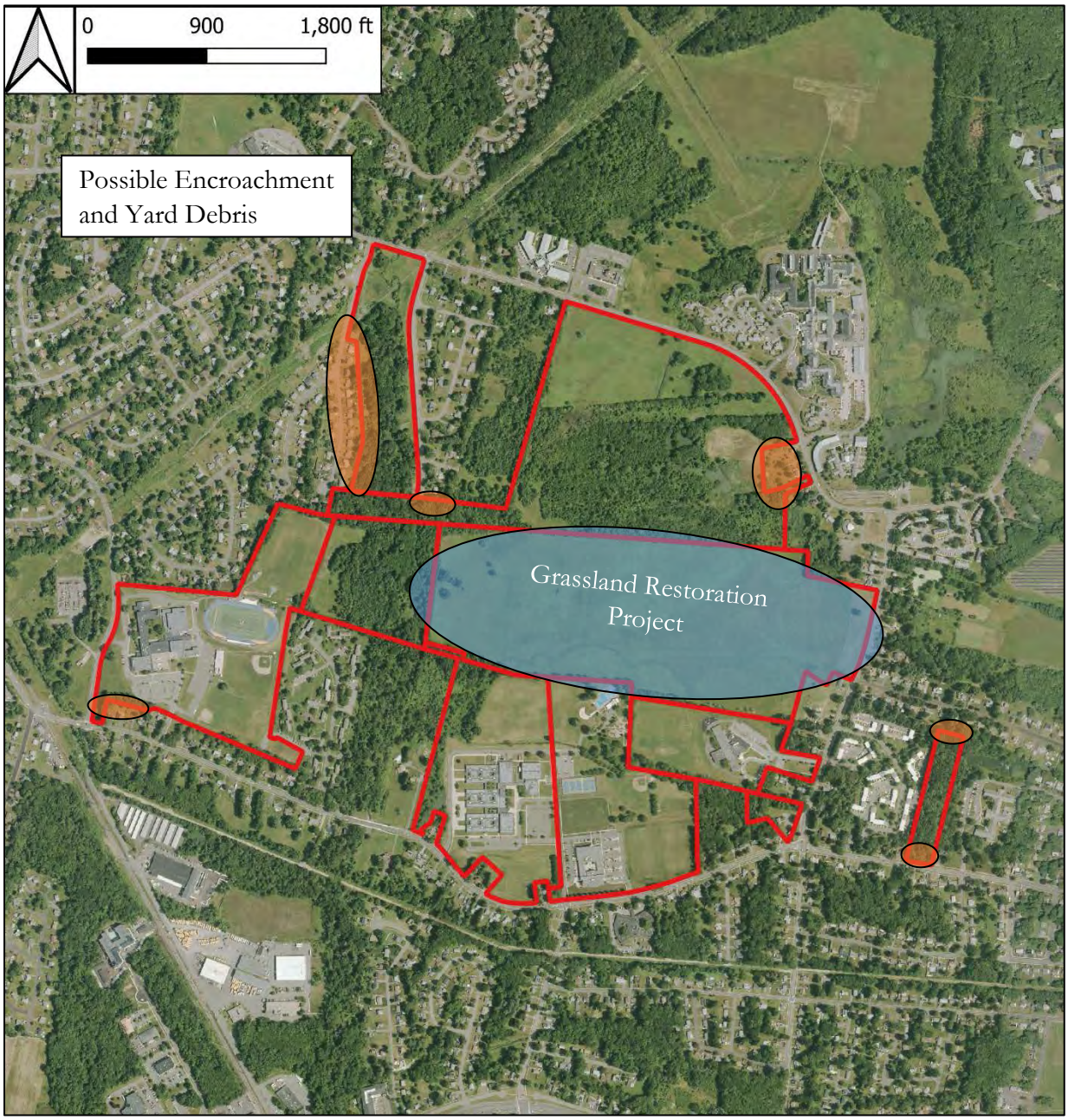
390 Park Ave, Bloomfield, CT 06002

CONNWOOD FORESTERS, INC.

PAGE **1**



- Organize a community event to remove trash and control invasive species.
- Mark property boundaries and remove old fencing
- Plant native wet-tolerant species to restore canopy gaps
- Create educational trails and signage
- Investigate grassland restoration projects


0
900
1,800 ft
Possible Encroachment and Yard Debris
Grassland Restoration Project

APPENDIX B – SPECIES LIST

Tree Species

Common Name	*Scientific Name*	USDA Symbol
Norway Maple	*Acer platanoides*	ACPL
Red Maple	*Acer rubrum*	ACRU
Sugar Maple	*Acer saccharum*	ACSA
Yellow Birch	*Betula alleghaniensis*	BEAL
Black Birch	*Betula lenta*	BELE
Paper Birch	*Betula papyrifera*	BEPA
Musclewood	*Carpinus caroliniana*	CACA
Bitternut Hickory	*Carya cordiformis*	CACO
American Chestnut	*Castanea dentata*	CADE
Pignut Hickory	*Carya glabra*	CAGL
Shagbark Hickory	*Carya ovata*	CAOV
Catalpa	*Catalpa speciosa*	CASP
Mockernut Hickory	*Carya tomentosa*	CATO
Hackberry	*celtis L*	CELTI
American Beech	*Fagus Grandifolia*	FAGR
White Ash	*Fraxinus americana*	FRAM2
Black Walnut	*Juglans nigra*	JUNI
Eastern Red Cedar	*Juniperus virginiana*	JUVI
Tulip Poplar	*Liriodendron tulipifera*	LITU
Nyssa	*Nyssa sylvatica*	NYSY
Hophornbeam	*Ostrya virginiana*	OSVI
Red Pine	*Pinus resinosa*	PIRE
Eastern White Pine	*Pinus strobus*	PIST
Eastern Cottonwood	*Populus deltoides*	PODE
Bigtooth Aspen	*Populus grandidentata*	POGR
Black Cherry	*Prunus serotina*	PRSE2
White Oak	*Quercus alba*	QUAL
Scarlett Oak	*Quercus coccinea*	QUCO
Chestnut Oak	*Quercus montana*	QUMO
Pin Oak	*Quercus palustris*	QUPA2
Red Oak	*Quercus rubra*	QURU
Black Oak	*Quercus velutina*	QUVE
Black Locust	*Robinia pseudoacacia*	ROPS
Sassafras	*Sassafras albidum*	SAAL
Willow Species	*Salix Spp*	Salix spp
Basswood	*tilia americana*	TIAM
Little Leaf Linden	*Tilia cordata*	TICO
Eastern Hemlock	*Tsuga canadensis*	TSCA
American Elm	*Ulmus Americana*	ULAM

Invasive Species

Common Name	*Scientific Name*	USDA Symbol
Norway Maple	*Acer platanoides*	ACPL
Tree of Heaven	*Ailanthus altissima*	AIAL
Japanese Barberry	*Berberis thunbergii*	BETH
Asiatic Bittersweet	*Celastrus orbiculatus*	CEOR
Autumn Olive	*Elaeagnus umbellata*	ELUM
Burning Bush	*Euonymus alatus*	EUAL13
Japanese honeysuckle	*Lonicera japonica*	LOJA
Amur Honeysuckle	*Lonicera maackii*	LOMA
Japanese Knotweed	*Fallopia japonica*	POCU6
Callery pear	*Pyrus calleryana*	PYCA
Pear	*Pyrus Spp*	Pyrus Spp
Multiflora Rose	*Rosa multiflora*	ROMU
Black Locust	*Robinia pseudoacacia*	ROPS

Urban Tree Planting List

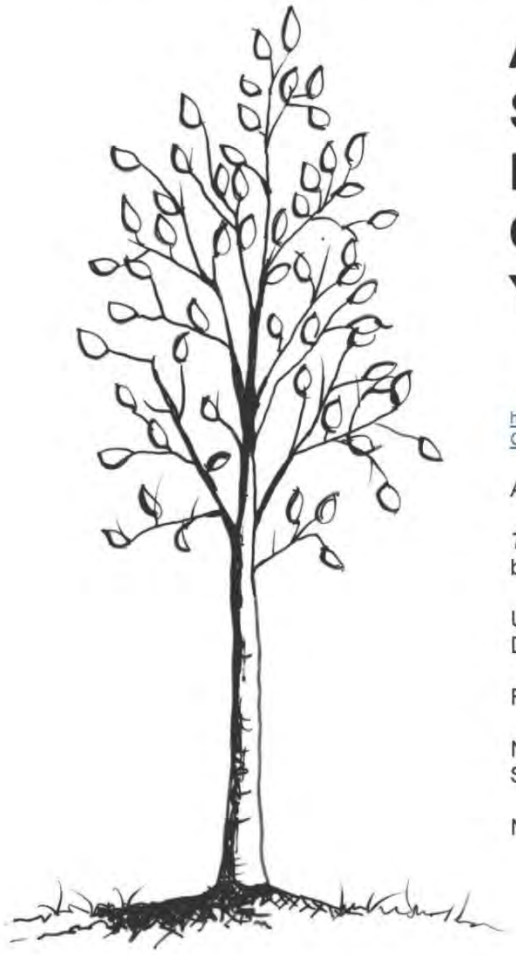
Large Trees: Species Name		**Form**	**Growth Rate**	**Environmental Tolerances**	**Location Tolerances**	**Notes/Suggested Cultivars**
Scientific	**Common**					
Ginkgo biloba	Ginkgo	Upright	Slow	Salt, Drought, High Wind, Pollution and High pH Tolerant	Median Tree, Narrow Growing Space	'Autumn Gold' or 'Presedential Gold'
Liquidambar styraciflua	Sweetgum	Pyramidal	Medium	Wet Site Tolerant	none	Plant Spring Only, lawn pits only, look for 'Rotundiloba'
Taxodium distichum	Baldcypress	Pyramidal	Medium	Wet Site, Salt and High Wind Tolerant	Median Tree, Narrow Growing Space	Ideal For Wet Soils
Tilia cordata	Littleleaf Linden	Pyramidal	Medium	Pollution Tolerant	Median Tree	'Greenspire'
Gymnocladus dioicus	Coffeetree	Rounded	Medium	Drought Tolerant	none	'Espresso'
Gleditsia triacanthos var. inermis	Honeylocust	Rounded	Medium	Wet Site, Salt, Drought, High Wind, Pollution, and High pH Tolerant	Median Tree	'Halka'

Quercus rubra	Northern Red Oak	Rounded	Medium	Salt Tolerant	none	Plant Spring Only
Quercus bicolor	Swamp White Oak	Rounded	Medium	Wet Site and Drought Tolerant	Median Tree	Plant Spring Only
Quercus imbricaria	Shingle Oak	Rounded	Medium	none	none	Plant Spring Only
Quercus palustris	Pin Oak	Rounded	Medium	Drought, High Wind, and Pollution Tolerant	Median Tree	Needs large tree pit
Quercus phellos	Willow Oak	Rounded	Slow	Drought and Pollution Tolerant	Median Tree	Plant Spring Only
Tilia americana	American Linden	Rounded	Medium	Shade and High pH Tolerant	none	'Redmond'
Tilia x euchlora	Crimean Linden	Rounded	Medium	Pollution Tolerant	none	Pest Resistant
Tilia tomentosa	Silver Linden	Rounded	Medium	Salt and Shade Tolerant	none	'Green Mountain'
Nyssa Sylvatica	Black Gum	Pyramidal	Medium	Wet Sites	None	Should only be planted in extremely wet sites
Ostrya virginiana	American Hophornbeam	Rounded	Slow	Shade and High pH Tolerant	Small tree pit	Plant in spring only

Small Trees: Species Name		**Form**	**Growth Rate**	**Environmental Tolerances**	**Location Tolerances**	**Notes/Suggested Cultivars**
Scientific	**Common**					
Amelanchier sp.	Serviceberry	Rounded	Slow	Wet Site and Shade Tolerant	Small Tree Pit	'Autumn Sunset,' 'Cumulus,' and 'White Pillar'
Cercis canadensis	Eastern Redbud	Rounded	Medium	Salt, Shade and High pH Tolerant	Median Tree, Small Tree Pit	Does Best in Lawn Pits
Carpinus caroliniana	American Hornbeam	Rounded	Slow	Shade Tolerant	Small Tree Pit	Plant Spring Only
Malus sp.	Crabapple	Rounded	Slow	Salt and Drought Tolerant	Median Tree, Small Tree Pit	M. zumi , and 'Donald Wyman,' 'Spring Snow' is seedless

Crataegus sp.	Hawthorn	Rounded	Medium	Salt and Drought Tolerant	Median Tree, Small Tree Pit	'Winter King,' 'Princeton Sentry,' or 'Crimson Cloud'
Cornus mas	Cornelian Cherry	Rounded	Medium	Salt Tolerant	Small Tree Pit	One of the first flowering spring trees
Prunus virginiana 'Schubert'	Schubert Cherry	Pyramidal	Medium	Salt, Drought, Pollution, and High pH Tolerant	Median Tree, Small Tree Pit	Tolerates Tough Conditions
Prunus cerasifera	Purpleleaf Plum	Rounded	Medium	Salt Tolerant	Small Tree Pit	'Atropurpurea,' 'Thundercloud'
Prunus 'Okame'	Okame Cherry	Rounded	Medium	none	Small Tree Pit	Earliest Blooming Cherry
Prunus padus	European Birdcherry	Rounded	Slow	none	Small Tree Pit	One of the First Trees to Leaf Out in the Spring
Prunus sargentii	Sargent Cherry	Rounded	Slow	none	Small Tree Pit	'Accolade' is Semi–double Flowering;
Prunus serrulata 'Kwanzan'	Japanese Flowering Cherry	Rounded	Slow	none	Small Tree Pit	Double–flowering
Prunus x yedoensis	Yoshino Cherry	Rounded	Medium	none	Small Tree Pit	Tree Does Best in Lawn Pits

Connecticut Tree Owner's Manual



A Guide for Selecting, Planting and Caring for Young Trees

https://portal.ct.gov/-/media/DEEP/forestry/CTTreeOwnersManualpdf.pdf

Adapted, with permission, from the

Tree Owner's Manual, published by the

United States
Department of Agriculture

Forest Service

Northeastern Area
State and Private Forestry

NA-FR-01-10

Note on the Connecticut Version

The Connecticut Tree Owner's Manual is an adaptation of the original Tree Owner's Manual*, produced by the US Forest Service. The layout and most of the artwork and text come largely from the original publication.

This version was assembled by individuals representing several of the associations connected with the state's urban forests. It seeks to provide the information needed to pick and plant a tree that will grow and thrive.

The Connecticut group's contribution was largely the addition of certain details to better reflect Connecticut practices and conditions. Treat the information presented as guidelines - there are exceptions to the rules.

The following individuals were involved with the creation of this updated version:

Roy Cavanaugh, *Tree Wardens' Association of Connecticut*
John Cottell, *Tree Wardens' Association of Connecticut*
Chris Donnelly, *Connecticut Department of Energy and Environmental Protection*
Dave Gindek, *Connecticut Nursery and Landscape Association*
Marielena Lima, *Connecticut Department of Energy and Environmental Protection*
Annie Mixsell, *Tree Wardens' Association of Connecticut*
Douglas Pistawka, *Eversource and Connecticut Tree Protective Association*

*the original version is available at www.treeownersmanual.info

Table of Contents

Important Precautions

WARNING: To reduce the risk of personal injury or permanent damage to your tree, read and follow these important precautions:

- ❑ Do not dig until you are sure there are no buried utilities. Call 811 at least two full business days before digging (p. 12) and visit Call Before You Dig (www.cbyd.com) for a reference guide with additional information.
- ❑ The lack of water is one of the most common causes of mortality in newly planted trees. Water regularly in the first three years after planting (p. 20).
- ❑ Never prune trees or branches that are within 10 feet of utility lines. Instead, contact your local utility company. All power lines shall be treated as if they are energized with potentially lethal voltages.
- ❑ Keep lawn mowers and string trimmers away from the base of your tree.
- ❑ Do not tie string, ribbon, wire, or pet leashes around the trunk or branches.
- ❑ Do not allow construction activities (digging, repaving, grading, building) within the Protected Root Zone (p. 30).
- ❑ Do not top your tree (p. 29).
- ❑ When hiring an arborist (https://arborists.ctpa.org), select someone who has a Connecticut Arborist license and general liability insurance of at least $1 million per occurrence and $2 million aggregate (p. 34).
- ❑ Check with your city or town tree warden (www.ct.gov/deep/treewardens) to see if there are laws regarding planting and pruning along town roads and with the Connecticut Dept. of Transportation for along state highways (www.ct.gov/dot).
- ❑ If you cannot prune your tree with both feet on the ground, hire an arborist (p. 34).
- ❑ Do not let children climb trees that have branches within 25 feet of a power line.
- ❑ Do not nail or screw anything into your tree.

These symbols are used throughout this manual:

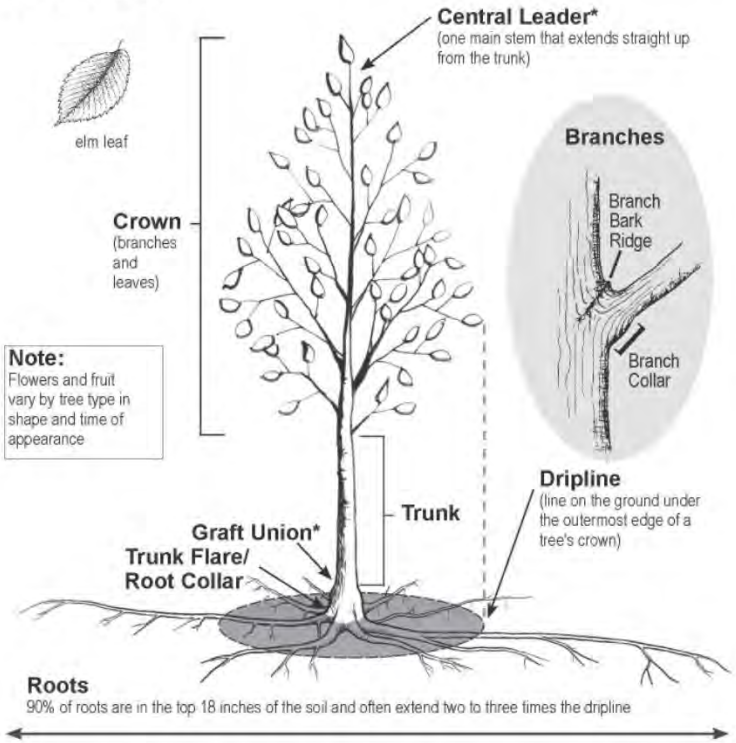
⚠ = Potential for personal injury or legal issues

= Potential for permanent damage to tree

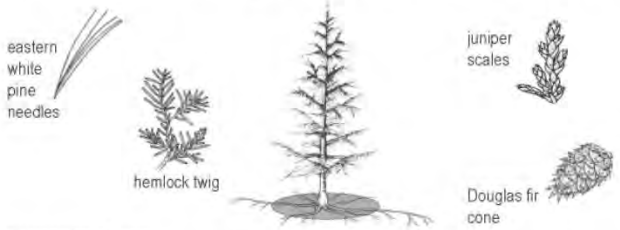
>>>>>>> Save this manual for future reference. <<<<<<<

Model Information and Parts Diagram

Tree Model



Deciduous trees (above) lose their leaves each year, usually in the autumn, while evergreen trees (below) generally keep their leaves for two or three years.



*Not present on all trees

Packaging

Roots

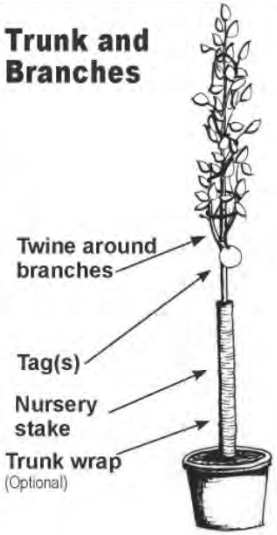
Your tree has been packaged in one of the following ways:

Balled and Burlapped

Containerized

Bare root

Trunk and Branches



See Installation (Planting) Instructions for information regarding removal of packaging.

Balled and Burlapped:

- The most common way of planting trees, especially larger ones, is as Balled and Burlapped (B&B).
- This method allows the trees to be stored for a longer period of time before planting.
- The ball includes a relatively large volume of soil. As a result, B&B trees are heavier than other types of trees.

Containerized:

- Containerized trees are usually of smaller caliper size.
- 100% of the root system is moved with the tree.
- Lighter than B&B trees, so easier to handle and ship. Large sizes are often unavailable.
- More frequent watering needed than with B&B trees, both before and after planting.

Bare root:

- Very light and easy to handle
- Often less expensive than B&B or containerized trees but harder to find
- Larger size trees and many species of trees do not transplant as well when they are bare root.
- Because the root system is exposed, careful attention to handling is required - roots will dry and die if not protected and kept moist.

Selecting a Tree

Decide on the type of tree

When planting a tree, be sure to select a tree that is suited to the site conditions. As you choose the "Right Tree for the Right Place", consider the following:

Mature Size of the Tree

Select a tree that will be able to reach its full mature crown height and width without interfering with buildings, overhead power lines, pavement or intersection sight lines (see illustration, p. 11).

Cold Hardiness

Can your tree make it through the winter? Find your plant hardiness zone (see map, p. 5). Select a tree that can tolerate the cold where it is to be planted.

Soil Drainage

Trees have preferences regarding water availability. Too wet or too dry and your tree may not survive. Check how quickly water soaks into the ground. Dig a hole 18 inches deep and fill it with water. Let it drain completely. Refill it again and time how long it takes for the water to drain.

Less than 2 hours = Very Fast
18 hours or more = Very Slow

Soil Test

Collect a soil sample from the area where the tree is to be planted and get a soil test to determine what species will grow under existing conditions and if soil modifications or amendments will allow for a broader range of options (p. 23).

Sun Exposure

Is the area mostly sunny, mostly shady, or some mix of sun and shade? Trees have preferences on how much sun they like as well.

TIP: Visit https://plantdatabase.uconn.edu/ To help with plant selection and plant identification of woody ornamentals.

Fill out the following worksheet to help choose a tree for your site.

Cold Hardiness Zone (write in) _____

Soil Drainage (circle one):

Very fast Medium Very slow

Sun Exposure (circle one):

Mostly sunny Morning or afternoon sun Mostly shady

Desired tree features (check all):

- ❑ Spring flowers
- ❑ Summer flowers
- ❑ Autumn leaf color
- ❑ Attract birds
- ❑ No messy fruit
- ❑ Provide shade
- ❑ Short
- ❑ Medium
- ❑ Tall

USDA Plant Hardiness Zones

The USDA Plant Hardiness Zone system was originally developed to aid gardeners and landscape professionals. It remains a valuable guide for helping architects, designers, landscape professionals and home owners choose the trees and other plants that are appropriate for the planting location.

The Plant Hardiness Zone Map is based on the average annual extreme minimum temperature as measured in a specific area. Conceptually, this means that extreme cold more than extreme heat governs the survivability of an individual plant.

In Connecticut, there are four Hardiness Zones:

- Zone 5b, in the northwest corner of the state, from -15° to -10°F
- Zone 6a, along the northern half of the state, from -10° to -5°F
- Zone 6b, along the southern half of the state, from -5° to 0°F
- Zone 7a, along the Connecticut shoreline, from 0° to 5°F

To find your Hardiness Zone by zip code, visit the interactive map at:

https://pdi.scinet.usda.gov/phzm/mm/ct_ri.jpg

Keep in mind, extreme cold is only one of the factors that should be considered when deciding whether a particular tree is appropriate for a site. Available water, drainage, soil type, available sunlight and competition from adjacent plants are all factors that should be considered.

Six Requirements to Grow a Successful Tree*

According to Jim Urban, there are six critical requirements to grow a successful tree:

1. Sufficient Soil Volume

The volume of soil available for rooting must be large enough to support the expected mature tree size.

2. Room for growth at the base of the tree

Leave ample area for the tree's trunk flare to grow. The first set of large roots extends out underground and rapidly tapers away from the trunk over the next 6 to 8 feet.

3. Water in

Trees, no matter their age, need a sufficient amount of water to survive and thrive. This water needs to be able to soak into the soil to reach the roots.

4. Water out

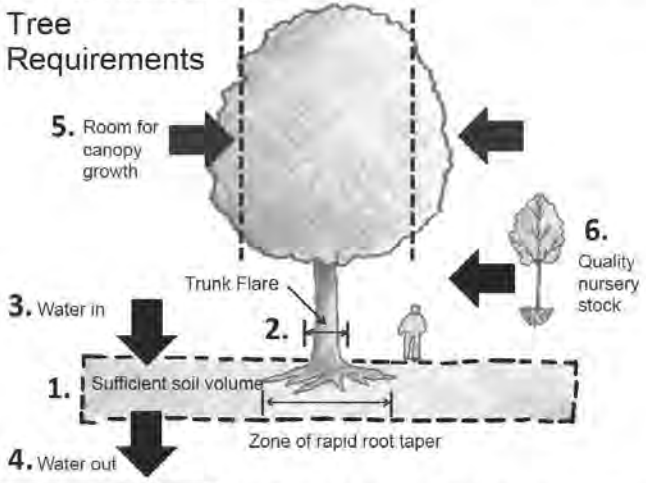
Water needs to be able to drain out through the soil as well. Take care that tree roots receive enough oxygen, so the tree doesn't drown. There is a balance of how much water should be coming in and going through the soil around the tree.

5. Room for canopy growth

Your tree will grow! Select a tree that will be able to reach its full mature crown height and width without interfering with buildings, overhead power lines, pavement or intersection sight lines.

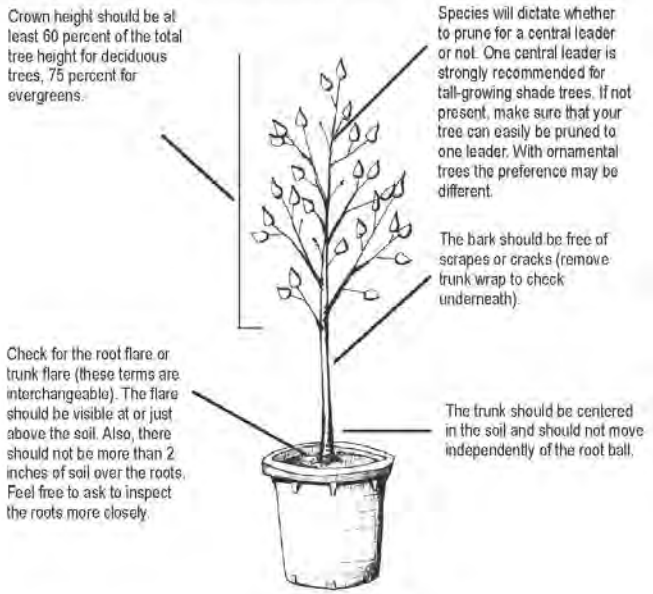
6. Quality nursery root stock

Tree planting must start with a quality, healthy specimen of the tree desired. Give your tree the best chance of survival.



*Adapted, with permission, from: Jim Urban (Fellow at the American Society of Landscape Architects and author of *Up by Roots: Healthy Soils and Trees in the Built Environment*): www.jamesurban.net/

Select a high-quality tree at the nursery



Tree planting must start with a good, healthy specimen of the tree desired!

Reject trees with:

1) dead bark, cankers or signs of disease or insects on the trunk or branches
2) poor branch structure, including tight, vertical branches where the bark is squeezed between two branches or between the trunk and a branch
3) an obviously excessive number of dead or broken branches
4) no sign of a root or trunk flare
5) any indications that it is dried out or has been improperly stored

Check with the nursery where you are purchasing your tree for recommendations regarding the particular species you are interested in. Research its mature size, growth habit, site requirements, special needs, susceptibility to pests, tolerance for drought, flooding, and wind damage.

Choosing Trees in a Changing Climate

The world today is highly interconnected. The increasing transport of goods and materials across oceans and continents is beneficial, although unintended consequences may arrive along with these items.

Invasive Plants

Invasive plants have been moved outside of their natural range and are particularly good at moving into and adapting to a new environment. They tend to have few natural enemies in their new environment because they did not co-evolve with that area's insects, diseases or herbivores that normally would keep a plant in check. Invasive plants often can outcompete native species for space and resources. The real concern of invasive plants is their ability to overwhelm and displace native species in a way that unbalances natural ecosystems.

The Connecticut Invasive Plant Working Group (www.cipwg.uconn.edu) keeps a list of non-native, invasive plants. Any reputable nursery will inform you if a particular tree or shrub is suspected of being invasive. As escaping from lawns and gardens is one of the key ways by which new invasive plants spread in Connecticut, property owners are asked not to plant invasives.

Invasive Insects and Diseases

Similar to invasive plants, non-native insects and diseases that arrive here can also spread rapidly and, in many cases, largely unopposed.

In the case of invasive insects and diseases, the problem is twofold:

(1) the invasive organisms do not have naturally occurring competitors and predators to slow them down, and

(2) native plants usually have not evolved adequate defense mechanisms to ward off attack by these insects or diseases.

Native plants often need assistance in defending themselves against these invaders. In many cases, this means the use of arboricultural treatments, including the use of insecticides or fungicides, to help protect these trees.

Alternatively, you may seek out a resistant variety of that tree and shrub. Tree nurseries have developed a wide variety of such resistant trees against many of the more common insects and diseases. While these resistant varieties may not be adapted to deal with new invasive pests, asking about insect and disease susceptibility and resistance is always a good idea when choosing a tree or shrub.

Climate Change

How will climate change affect the tree that you are about to plant? This is not an easy question to answer. Most people think of climate change in terms of a general trend towards global warming. At the local level, this will mean a longer growing season, higher average temperatures and more hot days. However, while warmth is an important factor in whether a tree survives, it is often colder temperatures that limit the geographic range of a tree as demonstrated by the Plant Hardiness Zone Map (p. 5).

In the future, we may have the same low temperatures as we have now, but just not as often. There may be as much precipitation as there is now, but coming in the form of more severe storms, with longer, drier periods in between. We may also have more sudden changes in weather, from day to day and week to week. These are all potential factors that could impact trees that are being planted now.

To be prepared for climate change, the recommendation is to choose a tree that likes weather that is as warm as or slightly warmer than we have now, but that can also handle the occasional cold snap. These trees should be carefully attended to during the establishment phase, to make sure that they are adequately watered. In addition, pay attention to any health or pest problems these trees might have. It is possible for new insects or diseases to move into an area as these organisms also adapt to the new weather patterns.

Benefits of Trees in the Face of Climate Change

Planting a tree is perhaps one of the best things an individual can do to combat climate change at the personal level. As trees grow, they remove carbon dioxide out of the atmosphere and convert it into the wood that makes up their roots, trunks and branches. The shade of the tree provides local cooling and can reduce energy consumption by reducing the need for air conditioning. Trees can also act as a windbreaker and reduce heating costs.

Planting a native tree is also an excellent way to boost local ecological diversity. Research has shown that native trees increase the number and diversity of insects locally, which in turn increases the number and diversity of birds, and so on. Visit http://bringingnaturehome.net/ to learn more.

Transporting Your Tree

Moving your tree is easiest if the branches are tied. Do not lift by the trunk if the roots are packaged with soil in a container or burlap. Instead, lift the tree by its root ball (see the sidebar on How to Move Your Tree, p. 13).

If your tree has leaves and will be sticking out the back of a vehicle, the crown should be wrapped or covered with a sheet, tarp, or burlap to prevent desiccation and wind burn. Also be careful that the wind does not whip the branches around.

Wrap or cover branches with a sheet or tarp! Do not keep a tarp on too long when there is extreme heat.

Tree fits in bed

Tree hangs out back of vehicle

Storing Your Tree Until Planting

Keep the soil around the roots moist to the touch. Store in a shady spot. Avoid hot asphalt!

For bare root trees, pack wet newspapers, sawdust, or mulch around the roots, and wrap them in a big plastic bag. Plant the tree as soon as possible (within two days). The biggest risk to bare root trees is the roots drying out.

For Balled and Burlapped or containerized trees, if you cannot plant the tree within 24 hours, water the roots well and either cover the entire root ball with mulch or wrap the root ball in plastic or a tarp. Keep the soil moist to the touch. If the burlap is not treated to resist rotting - be careful! It will decay quickly under most circumstances. That will make it very difficult to move the tree with the ball intact.

Before you leave the Nursery or Garden Center, write down:

- **Where tree was purchased**
- **Date of purchase**
- **Warranty period (years)**
- **Type of tree (species)**
- **Mature height and width**

Pre-Installation (Preparing to Plant)

Instructions

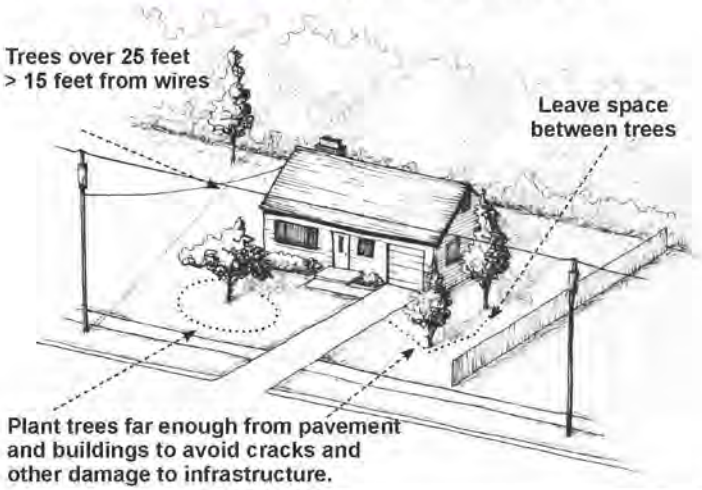
Step 1: Check above ground.

Your tree will grow.
Consider the mature tree size and root spread when planting as to not interfere with overhead utility lines, buildings, pavement, or intersection sightlines.

1. You can plant your tree:
   - ❑ near roadside power lines if it will grow less than 25 feet high
   - ❑ at least 15 feet from power lines if it will grow 25-45 feet high
   - ❑ at least 30 feet from power lines if it will grow more than 45 feet high
2. Place trees away from roadside salt spray zones. Road salts desiccate foliage and prevent proper water uptake. Consider planting salt tolerant species where salt will be an issue.
3. Trees planted too close to intersections may block road signs resulting in vehicular safety hazards.

A newly planted tree might look all alone. Don't worry, it will grow!

TIP: Visit eversource.com 'Plan Before you Plant' for recommendations on planting trees near power lines.



Step 2: Check below ground.

Do not plant large trees in narrow roadside strips as the tree may not have adequate rooting volume to support itself.

⚠ **Call Before You Dig - It's the law in Connecticut.**
If you don't call and then hit an underground power line, you may be held liable for damages.

⚠ **Shocks can be deadly.**

At least 48 hours in advance of planting, call the underground utility locating service in your area to be sure that there are no buried utilities where you want to plant. Most services will mark utilities (e.g., electric, cable, gas) for free.

Call before you dig!
Dial 811

www.cbyd.com

Step 3: Check for other laws.

If you are planting a tree along a town or city street, you may need the permission of the municipal Tree Warden. If the tree is to go along a state road, you must check with the Connecticut Department of Transportation.

Will Your Tree Become a "Public Tree" Under the Control of Your City or Town?

Public trees are those located on municipal property or within the road right-of-way (ROW)–regardless of who planted the tree.

The ROW is an extension of your city's or town's control beyond the street edge, often times reaching 10 feet or more beyond the pavement.

You may need to contact your City Engineer or City Hall to find out where the ROW is adjacent to your property.

Trees located within the ROW are under the jurisdiction of the municipality.

In these cases, state or local laws have authority over the type and location of trees that can be planted in the ROW. Check with your city or town tree warden (www.cttreewardens.org) regarding ordinances or policies pertaining to public trees.

Installation (Planting)*

How to Move Your Tree

Carry your tree by its root package (ball or container)—not the trunk! Steady it by holding the lowest part of the trunk.

Large containerized trees may be tipped onto the bottom edge and rolled.

For Balled and Burlapped trees, you may find it easiest to place tarps or ropes under the ball as a sling.

A dolly, ballcart or other cart may also be used.

Protect the trunk.
Even a small wound on a young tree can cause permanent damage.

Materials

- ❑ Tape measure or yard stick
- ❑ Metal skewer, coat hanger, stout wire, or pointed screwdriver
- ❑ Shovel, spade, iron rake, wire rake, crow bar; backhoe for larger trees
- ❑ Sharp knife or scissors
- ❑ Hand pruner—*bypass* type (p. 26), pruning saw, loppers
- ❑ Water supply
- ❑ Mulch to provide a 2-4 inch layer over the planting area
- ❑ Large-gauge wire cutter if Balled and Burlapped
- ❑ Hand saw if containerized and the main root system is more than 1 inch below the soil surface (Step 3). An inexpensive folding pruning saw works well, but any saw would work.

Instructions

If you have NOT yet read the section on Pre-Installation (Preparing to Plant), do so now.

Do not dig until Step 5.

*Adapted in part, from: Hargrave, R.; Johnson, G.; Zins, M. 2002. Planting trees and shrubs for long-term health. St. Paul, MN: University of Minnesota Extension Service. 12 p.

Step 1. Move the tree to its planting site.

Young trees are not 2 by 4's.
Do not lift or carry your tree by its trunk (unless bare root). See the sidebar on How to Move Your Tree (p. 13).

Step 2. Remove trunk and branch packaging after tree is at its planting site.

Once the tree is at the planting site, remove the trunk wrap, any twine around the branches and any labels or tags. Leave any root packaging in place for now.

Step 3. Find the trunk flare.

The trunk flare is where the trunk expands at the base of the tree and typically starts to curve (see illustration, p. 2).

Bare root trees: There is no soil or root packaging to remove. The biggest risk to bare root trees is the roots drying out, so keep roots moist.

In the case of B&B and containerized trees, the trunk flare may be buried under excess soil. Find where the trunk flare is relative to the base of the root ball.

TIP: Probe the soil ball with a stiff wire, skewer, or screwdriver to find the trunk flare and estimate how much soil will need to be removed, if any.

Balled and Burlapped trees: Try not to overly loosen the top of the burlap at this point. You can gently probe the root ball, pushing through the burlap and into the soil until you encounter a woody root. Do this carefully so as to not injure the root. Do this at a couple of places around the ball, 3 or 4 inches out from the trunk, until you know where the top depth of the roots are in the ball.

Alternatively, open the top of the root ball packaging just enough to see the top of the root ball. A small slit in the burlap might be the best way to do this. Is the trunk flare at the top of the root ball? If not, dig by hand or use a piece of stiff wire to find how deep the top roots are into the root ball. Make note of that depth.

A root ball should remain a root ball.
If it starts to fall apart as you open the burlap, stop!

Either way, use that number to determine the height of the root ball. If the first roots are more than 4 inches below the top of the root ball, consider returning the tree to the place of purchase. Leave the rest of the burlap and wire basket in place until the tree is put in the planting hole.

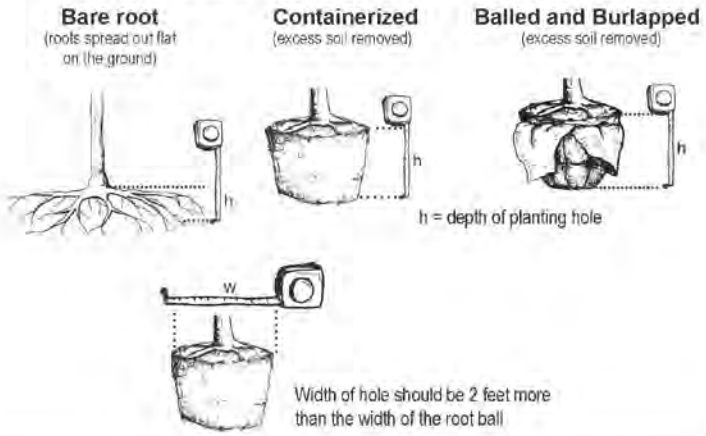
Containerized trees: Remove the entire container. If needed, pull or cut the soil off the top of the root ball until the trunk flare is found. If roots are massed along the sides and/or bottom of the container, cut off the bottom inch or two of massed roots and slice through the sides of the root ball in three to five places (depending on container size). If possible, pull roots that are growing downward out so they are more lateral, radiating away from the trunk.

TIP: An old saw works well to remove the top layer of soil. Be careful not to cut into the trunk.

Step 4. Determine how deep and wide to dig.

A. Measure the height of the root ball. Adjust downward if you had to dig into the root ball to find the flare or top roots. This depth of the planting hole should be no greater than the height of the root system.

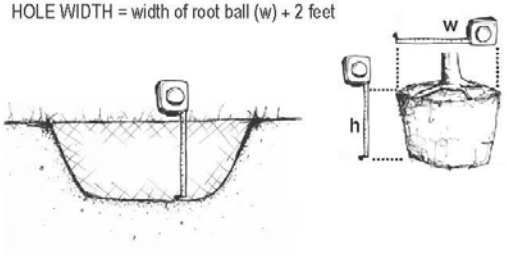
B. Measure the approximate width of the root ball or root system. Add two feet to this, or more depending on if your soil is hard (clay or compacted). This is approximately how wide you should dig the hole to give yourself enough room to work.



Step 5. Dig a hole to the dimensions from Step 4.

Do not put a $100 tree in a $10 hole.
The dimensions of the hole are very important in determining the survival of your tree. Break up compacted soil and then dig the hole ONLY as deep as the root system (NO deeper!). Loosening the soil beneath the tree will cause the tree to settle and become planted too deeply. Score the walls of machine-dug holes to prevent glazing.
Check for drainage (See Soil Drainage, p. 4).

HOLE DEPTH = height of root ball (h)
HOLE WIDTH = width of root ball (w) + 2 feet



Step 6. Put the tree in the hole.

This is labor intensive work, therefore be careful when moving the tree. You want to be sure you have enough helpers on hand.

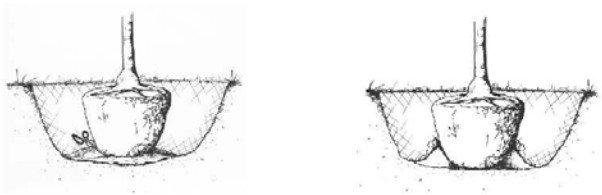
If the tree is **bare root** or **containerized**, you can probably just place the tree into the hole. If the hole is too deep, take the tree back out and put more soil in the bottom of the hole. Compact this soil so that the tree won't settle deeper into the hole. Turn the tree so that it is oriented in the direction you like. You can pack some soil around the base of the roots to hold it into position.

If the tree is **Balled and Burlapped**, you will probably have to slide it, very carefully, into the hole. This usually takes at least two people. It helps to know which way you want it to face before you place it into the hole, as adjustments are difficult with a heavy root ball. You might find a shovel or spade to be very useful in helping to straighten the tree out once it is in the hole. Being very careful, use it to slightly lift and turn or straighten the root ball in the hole. Stabilize the tree by packing just enough soil around the base of the root ball.

Step 7. For Balled and Burlapped trees, remove root ball packaging.

Wear gloves.

Using gloves and heavy gauge wire cutters, cut away at least the upper third of the wire basket. Remove the wire from the hole. Then, cut and remove as much burlap as you can from at least the top third of the root ball. Make sure nothing is left wrapped around the trunk. Twine left around the base of the tree can choke it. Now, carefully pull back all of the soil that is above the trunk flare. Level the soil out across the top of the ball. The base of the aboveground portion of the tree should be about level or a touch above the level of the surrounding soil.



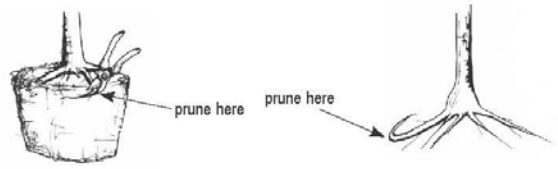
Once in the hole, a root ball should remain a root ball.
If it starts to fall apart as you take off the wire and burlap, backfill the hole with enough soil to stabilize it. Then carefully remove the wire and burlap, and backfill as you go to keep the root ball intact.

Step 8. Remove problem roots.

Wear gloves.

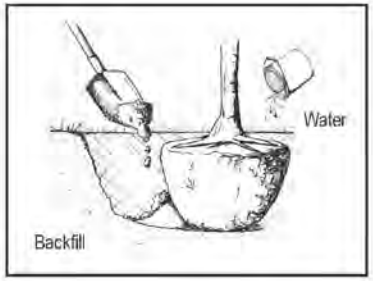
A. Remove all small roots above the main root system with a hand pruner.

B. Examine the main root system for roots that extend out but then turn to the side or back towards the trunk. Prune these roots at the point where they turn.



Step 9. Backfill with the same soil or amend as recommended by the soil test.

Make sure the trunk is straight. Put the original soil back in the hole, breaking up large clods, and working it in with your hands or a shovel.



Step 10. Water.

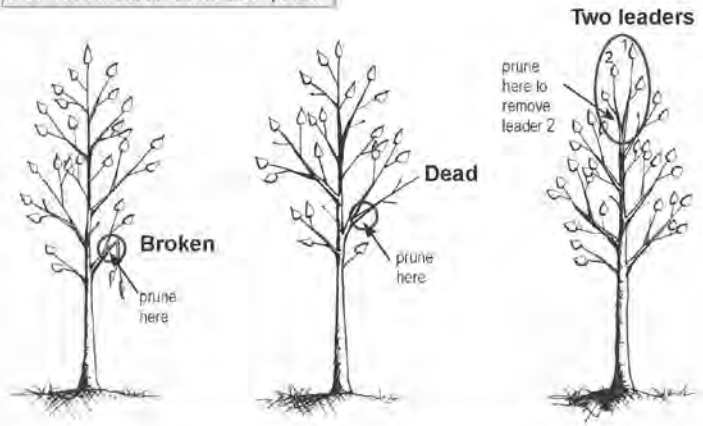
Thoroughly water the root ball and entire backfilled area to fill any air pockets and allow the soil to settle. If desired, mound a 3-inch berm on the perimeter of the planting hole to retain water.

Step 11. Prune critical branches and no others!

Prune only branches that are broken or dead. You may also remove competing leaders, if present. Most trees should have one central leader (p. 2). If there are two or more leaders, choose which one you want and remove the other(s).
Note: You might need to do some of this work before placing the tree in the hole.

Minimize pruning at the time of planting!
Trees need as many leaves as possible to recover from transplant shock (leaves produce the tree's food).

See "Structural Maintenance" p. 25.



Step 12. Mulch.

Put a 2-4 inch layer of mulch over the backfilled area. Pull mulch away from the trunk so that none touches the bark.

By blocking sunlight from reaching the soil, mulch hinders the growth of weeds and helps keep string trimmers away from thin young bark. It also generally improves the condition of the soil and encourages the growth of new roots.

To Stake or Not to Stake

Newly planted trees do not always need to be staked. If not done properly, staking can harm a tree. In order to grow strong, trees need the stimulation that comes from the wind's movement. Staking improperly or for too long can interfere with the tree growing correctly.

Stake only if the root ball is unstable or the trunk is bending excessively. Some trees need to be staked to remain standing straight in their new planting site. There are many options for staking a tree, such as wide nylon, canvas straps, or nylon stockings. Check with your local nursery for supplies and recommendations. The tree should not be tied tightly.

If the root ball is unstable, use 1-3 stakes attached LOW on the trunk. Check seasonally and tighten stakes as needed.

If the trunk is bending, use one stake attached HIGHER (at least six inches below the first set of branches).

To prevent trunk girdling, remove stakes after one year or once the tree has become established.

A Note on Young Trees - Trees need to establish their root systems before they can grow. During the first couple of years after planting, it is much more important for the roots to develop than for the branches to grow and spread. This may mean that the crown of the tree looks sluggish during that early period, but that is not necessarily a problem. Planting can be tough on a tree, making watering and a nurturing environment vital for a tree to recover. Remember what the old-timers say: After a tree is planted, in its first year, it sleeps, in the second year it creeps and, then, in its third year, it leaps.

Maintenance Instructions

Watering*

It is important for tree survival to provide the right amount of water. Lack of water can easily kill a newly planted tree. The first three years are most critical, but pay attention to watering needs throughout the tree's life.

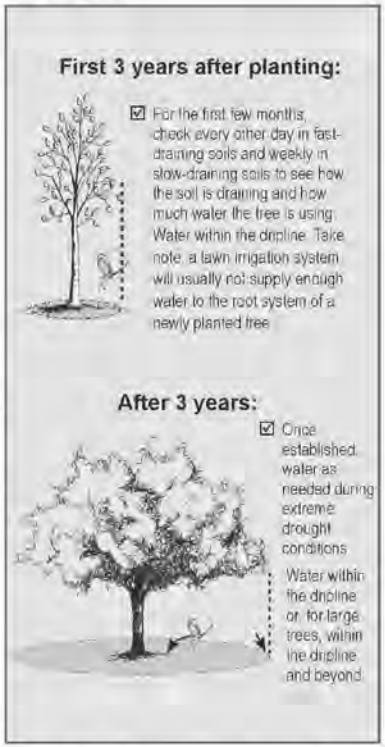
How often and how much?
Frequency depends on the species, soil drainage and seasonal weather conditions. Soils that drain quickly will require more frequent watering than those that drain slowly. Determine your soil's drainage rate (p. 4).

A good rule of thumb is to plan to water every week, particularly in the first year. Be sure to soak the roots around the base of the tree - a young tree can only make use of water that reaches its roots. A slow, deep watering is best. A soaker hose or a watering bag helps.

For most trees, 10-20 gallons weekly is not too much, however check with a CT licensed arborist for watering requirements of the species being planted.

Keep watering for the first 3 years. After 3 years, an established tree may not need as much watering. Continue to watch carefully for signs of underwatering or overwatering.

You can overwater a tree. Not all tree species like a lot of water. If the soil around your trees never seems to dry out and the tree does not look healthy, it may be overwatered. Be sure to check the drainage.



When? Start checking soil moisture and watering when necessary in early spring, and continue until the soil freezes. Watering can be done during the winter for newly planted trees when temperature permits and if rain or snowfall has not provided adequate moisture.

*Adapted in part, from: Gilman, E. 1997. Trees for urban and suburban landscapes. Albany, NY: Delmar Publishers. 66 p.

Installing a Trunk Guard*

Trunk Protection

Young deciduous trees have thin bark that can easily be damaged by animals. Rodents such as rabbits and mice like to chew on young bark. Deer also damage young trees by scraping tree trunks with their antlers.

Any paper trunk wrap that is present should be removed at time of planting.

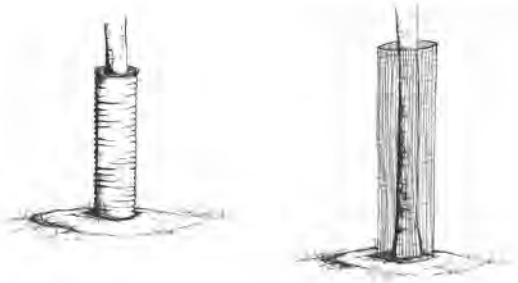
If concerned about trunk wounding, consider installing plastic tubing or hardware cloth (stiff wire fencing with 1/4-1/2 inch mesh squares) around the trunk. The tube should be big enough around to allow 1-4 inches of space between it and the trunk. It should be 1-3 feet tall (above snow height) for small rodents and as tall as possible (to lowest branch) for deer.

How? Wrap the tube around the trunk, taking care not to scratch the bark. Use a few pieces of wire to keep the tube closed. Push the tube into the ground or mulch less than an inch. Attach it to one or two stakes if necessary.

When? For rodents, install before snowfall as rodents and rabbits will feed on tree bark under the snow. Apply early in the autumn to prevent deer scraping.

Protection can be applied anytime and should be removed to allow for air circulation once the threat of damage is no longer there. Be sure to remove leaves and debris from the tube regularly to prevent insects and decay.

Your tree will grow. Plan accordingly.
As the tree grows, the tube will need to be enlarged and eventually removed.



*Optional: Important in areas where deer or rodents are active.

Preventing and Correcting Encircling Roots*

Problem

Roots that encircle the trunk will likely cause health or safety problems later. Make sure that soil or mulch is never piled against the root collar.

Root likely to become a problem (when trunk and root meet)

Problem root already touching the trunk

Covering the root collar with soil or mulch encourages encircling roots

How to Prevent

Plant at correct depth with the root collar (trunk flare) at level of the surrounding soil (see Planting Steps 3-5 and 7-8, p. 14-17).

Avoid volcano mulching (p. 23).

How to Monitor and Correct

Every 4-5 years, check for roots that encircle the trunk. Use a hand trowel to loosen and remove the soil around the base of the tree until the first set of roots is found.

TIP: Removing soil with a wet-dry vacuum speeds up the work without harming the roots.

If a tree has an encircling root, leave the top of the root exposed, and consult a CT licensed arborist regarding treatment. When caught early, this can be an inexpensive and effective way to save your tree.

*Adapted in part, from: Johnson, G.; Fallon, D. 2007. Stem girdling roots: the underground epidemic killing our trees. St. Paul, MN: University of Minnesota.

Mulching

Maintain a ring of mulch around the tree (the wider the better) to reduce turf competition, protect the stem from mechanical injury (most commonly string trimmers and lawn mowers), provide organic matter to soils, conserve soil moisture, and moderate soil temperature. Organic materials like wood chips and leaves are best. Wood chips will take longer to break down and, therefore, will not require replacement as often. Never mulch stem or root collar tissues.

TIP: Newspaper kills grass.
If there is grass in the area that needs to be mulched, put a 5-page layer of newspaper over the grass, and then add mulch on top (this will help keep the grass from growing up through the mulch).

Mulch becomes soil.
There should never be more than four inches of mulch over the roots. Too much mulch or soil can prevent oxygen from reaching the roots. Refresh as needed, but consider removing old mulch to prevent buildup.

Fertilizing

Do not assume a fertilizer is needed. At the same time, it is not unusual to find soils that are highly disturbed, compacted, low in organic matter, and have a high or low pH. To learn about your soil, collect a soil sample and get it tested at the Connecticut Agricultural Experiment Station (CAES), UCONN Extension or your local nursery. Apply fertilizer or soil amendments ONLY if a soil test indicates a need or if a diagnosis by a CT licensed arborist indicates that it is necessary.

Do not overdose.
Fertilizer that is not absorbed by the tree has the potential to alter the soil or leach out and pollute groundwater, rivers, ponds, and lakes. Overdosing with fertilizer can harm your tree.

Applying "weed and feed" to your lawn might injure or kill your tree.
Be very careful with weed killers. They have the potential to injure trees. Whenever applying chemicals, such as fertilizers and pesticides, always read the label for directions and precautions.

Checking Tree Health

Tree health can be difficult to determine, but checking your tree yearly may help you notice problems as they appear.

Is the current year's growth much less than past years' growth? Fast growth does not mean good health, but a dramatic reduction in growth rate may be an indication of poor health.

TIP: Look at the branch tips or tree top.
Current year's branches will typically be smaller in diameter and a different color.

Also inspect the size, color, and distribution of the leaves. Look at individual leaves as well as the whole crown for differences between branches or sections of the crown.

Inspect the base of the trunk for damage (e.g., from rodents or string trimmers).

Also inspect the base of the tree to see if there is a flat side to the trunk.

If anything is found, follow the guidance in the Troubleshooting section (p. 32) or contact a CT licensed arborist (p. 34).

Checking Tree Safety

Inspect trees anytime, but especially after storms. Examine the crown, branches, trunk, and area around the roots for these common dangers:

- Broken, dead, or hanging branches
- Cracks, fungi, and cavities
- Weak trunk or branch unions
  See illustration to the right.
- Encircling root compressing the trunk (a flat-sided trunk at the ground level is a good indicator).
  See illustration above.
- Recent lean (especially if the soil or grass has lifted on one side).

Branch Unions

If anything is found, or if in doubt, contact a CT licensed arborist (p. 34).

Structural Maintenance*

Pruning for structural maintenance is an important part of maintaining a safe and healthy tree. Working with a young tree so that it develops the proper form is critical to the long-term health and structural stability of that tree. Older trees (at least 10 years of age) also may need structural maintenance to correct storm damage, remove dead wood, or correct interference with infrastructure or buildings.

Pruning trees can be dangerous work. Follow these safety precautions to be sure you are around to enjoy your tree.

⚠ **Electricity flows through branches.**
Never prune trees or branches that are within 10 feet of utility lines; instead contact your local utility company or hire a qualified line clearance company.

⚠ **Ladders and trees do not mix.**
If pruning cannot be done with both feet on the ground, hire a CT licensed arborist (p. 34).

⚠ **Chainsaws are dangerous.**
If power equipment is required, hire a CT licensed arborist (p. 34).

⚠ **Saws and pruners are sharp.**
Wear gloves to protect your hands and eye protection to protect your sight.

The main reasons for pruning trees are safety, health, and esthetics. Pruning can encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather.

Pruning for safety involves removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways, and removing branches that grow into utility lines.

Pruning for health involves removing diseased or insect-infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches.

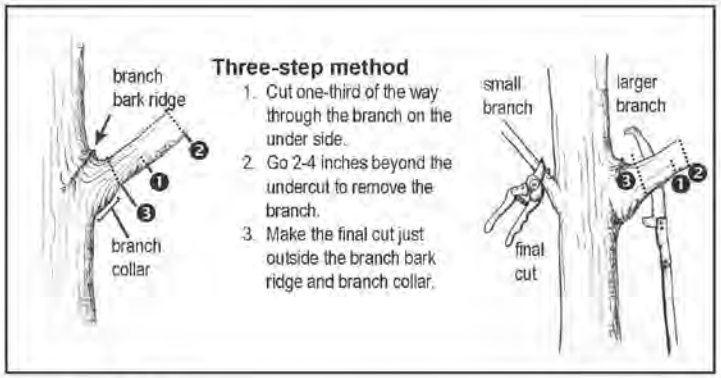
Pruning for esthetics involves enhancing the natural form and character of trees or stimulating flower production.

*For more on pruning, visit: How to prune trees - USDA Forest Service Northeastern Area. 30 p. www.fs.usda.gov/naspf/publications/how-prune-trees-na-fr-01-95

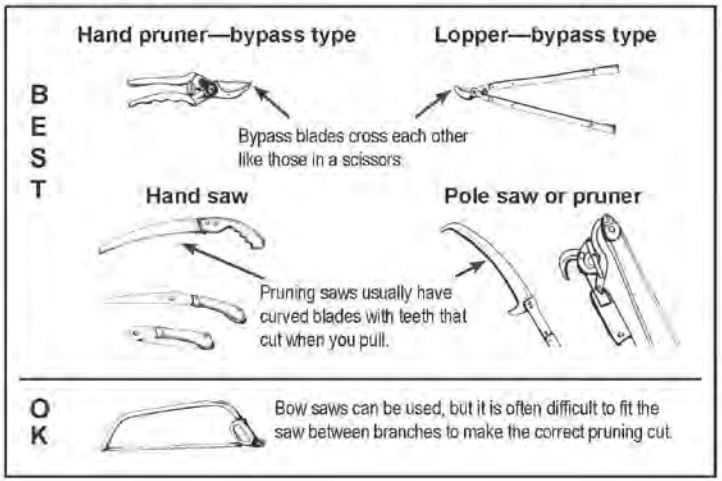
Where to Cut

When using a hand saw, support the branch with one hand while you are cutting to prevent the bark from ripping (Do not do this with a chain saw!). If the branch is too large to support, use the three-step method (see details below).

For the final cut using either method, look for the branch bark ridge and branch collar. Begin the cut just outside of the branch bark ridge and, in a straight line, angle it down and away from the trunk. Stay close to the branch collar without cutting into it (see images below). Do not apply wound paint to the cut surface.



Pruning Tools



How Often

Except for dead or broken branches, most pruning should wait until the tree has been established in its new location, at least 3 years depending on its size at planting. Once the tree is established, prune lightly every year or every other year as needed. After 10 years, frequency of pruning depends on the type of tree, health of the tree, and amount of shade the canopy receives.

Do not remove excessive amounts of live branches or foliage. As a rule of thumb, remove no more than 25 percent of the tree's live branches or foliage at any one time.

Tree Type	First 10 years	10+ Years After Planting
Fruit trees	Once every 1-2 years	Once every 1-3 years & as needed
Deciduous shade trees	Once every 1-2 years	Once every 4-7 years* & as needed
Evergreen trees	Only as needed**	Only as needed**

* Pruning lightly and more frequently is better than pruning heavily and less often.

** Evergreen trees usually need pruning only if they are diseased, their branches need to be raised up from the ground or to remove codominant leaders (p. 18). In either case, prune off the entire branch.

Removal of the following can be done every year:

- Broken, dead, or rubbing branches
- Branches sprouting from the base of the trunk
- Water sprouts anywhere on the tree

Time of Year

Winter is the best time of year to prune because branches are easy to see, diseases cannot be spread, and there is minimal stress to the tree. But for most trees, pruning can be done at any time.

Exceptions are trees that are prone to fire blight. Trees susceptible to fire blight include mountain ash, apple, crabapple, hawthorn, pear, flowering quince, and pyracantha. To minimize disease infection of these types of trees, pruning should not be done during the growing season and sanitation of the cutting tools is critical.

Check with a CT licensed arborist or nursery for advice on timing of pruning specific species. The best time to prune flowering trees is after the flower has formed. Some trees "bleed" or have heavy sap flow in the early spring which does not usually affect the health of tree species. These species include, but are not limited to, dogwood, walnut, honey locust, hornbeam, sophora, maple, birch, and elm. It is better to prune elms in the winter to help reduce the risk of Dutch elm disease. Elm bark beetles that spread this disease are drawn to wounds and are not active in the winter.

Pruning Young Trees*

A young tree should be pruned once it is established, about 3-5 years after it is planted. Removing small branches is fairly easy compared with waiting until limbs are large, when pruning can be costly and pose a greater risk to the tree. Correctly pruning a tree when it's young will help it develop a strong, well-balanced crown. Prune to achieve the following:

A. Branches that are well-attached to the trunk

Strongly attached branches at a wide angle to the trunk are less likely to break off in wind or heavy ice or snow. Branches that are less than half the diameter of the trunk are also less prone to breakage in storms.

B. One central leader

Most trees will be strongest if they have one central leader. Check with a CT licensed arborist or your local nursery if your tree should have a strong central leader. If so, choose one leader to keep and prune off the competitors.

C. Good spacing between branches

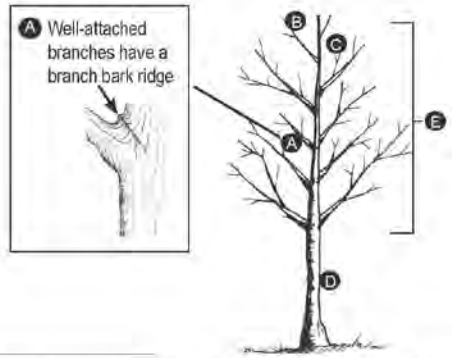
Vertical space between branches will vary with species. Try to space branches equally around the tree so that branches do not rub against each other. Consult with a CT licensed arborist on the growth habit of your particular tree.

D. Enough clearance between the ground and first branch

As a tree grows, its branches remain at the same height. Branches located low on the trunk may get in the way of sidewalk paths or lawn mowing as the tree grows. Over time, gradually remove low branches as needed and according to the growth habit of the species. For street trees, the height of the lowest permanent branch over a sidewalk should be at least 8 feet, while over the street, the height of the lowest branch should be at least 14 feet.

E. Good crown height

For its health and stability, the crown of a deciduous tree should be at least 60 percent of the total tree height.



*Gilman, E. 2002. An illustrated guide to pruning, 2d ed. Albany, NY: Delmar Publishers. 330 p.

Topping*: (Also called stubbing, heading, tipping, hat-racking, dehorning, or roundover)

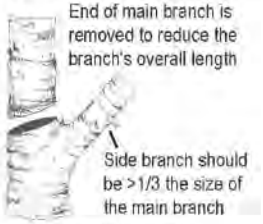
Topping is not pruning.
(Pollarding is an exception)
Topping is the indiscriminate removal of branch ends. Topping injures and can ultimately result in the early failure or death of a tree.

TIP: Proper reduction pruning involves cutting the main branch back to a side branch that can take over. The size of the side branch should be at least 1/3 the diameter of the main branch where the main branch is cut.

Myth: Topping will make the tree easier to maintain.
Truth: Topped trees can regain their original height quickly, often in two years. A topped tree will require more attention than a properly pruned tree because of the profusion of fast growing, loosely attached shoots that will form.

Myth: Topping invigorates a tree.
Truth: Topping immediately injures a tree and can start it on a downward spiral. Topping wounds expose the tree to decay and invasion from insects and disease. While a tree may survive topping, its life span may be significantly reduced.

Myth: Topped trees will add value to your property.
Truth: Topped trees lack natural beauty and may reduce your property's value. Also, a topped tree can become hazardous and cause property damage.



Reduction Pruning**


Topped tree


Topped tree with regrowth

*Adapted, with permission, from the "Experts Agree: Don't Top Your Tree" campaign which was developed by the Missouri Community Forestry Council and Forest ReLeaf of Missouri
**Adapted, with permission, from: Gilman, E. 2002. An illustrated guide to pruning, 2d ed. Albany, NY: Delmar Publishers.

Protecting Trees from Construction Damage*

Are you planning to build or remodel a home? Are you going to expand or pave your driveway? Are your city's streets, curbs, sidewalks, and buried utilities about to be widened, modernized, or replaced? Before construction begins, consider the impact on trees.

Careful tree protection will help you avoid the expense and heartache of later repairing or removing trees that were located too close to construction activities (see "How Close is Too Close?" below). Depending on the type of construction and proximity to trees, you may be able to protect the trees yourself, or it may be best to consult with a CT licensed arborist to design, implement, and enforce a tree protection plan.

Start planning early. To minimize costs and increase the likelihood of successful tree preservation, start tree protection planning as soon as possible.

How Close Is Too Close? Defining The Protected Root Zone (PRZ)

The tree's Protected Root Zone (PRZ) can be identified as follows:

1. Measure the diameter (width) of the trunk 6-8 inches above the ground, to the nearest inch. To do this, either wrap a tape measure around the trunk and divide that number by 3 or hold a yard stick up to the trunk and approximate the distance. Record that number.
2. Multiply that number by 1.5 for mature or stressed trees or by 1.0 for young, healthy trees. Consider that number as representing a radius from the tree in feet.
3. Measure out that distance from the trunk of the tree. The area within this radius is the Protected Root Zone (PRZ).

PRZ radius (ft) =
1.0 or 1.5 × trunk diameter (in)

Example:
1.5 × 24 in = 36 ft

*Adapted, with permission, from: Johnson, G. 1999. Protecting trees from construction damage: a homeowner's guide. St. Paul, MN: University of Minnesota Extension. 21 p.

The activities listed below all negatively impact tree roots. To protect your trees, define the Protected Root Zone (PRZ), and keep these activities away from this area, at a minimum.

Storing Materials and Moving Equipment

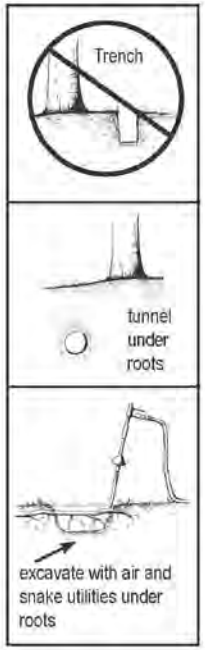
Soil compaction is one of the main killers of landscape trees. Stockpiling building materials, using heavy machinery, and excessive foot traffic all compact the soil. To minimize damage, install orange polypropylene or chain link fencing and post "Off Limits" signs around the PRZ of the trees you plan to save. Check the fence often to be sure that it is still intact and serving as a barrier.

Changing the Grade

Adding or removing as little as 2 inches of soil in the PRZ can kill a tree. To minimize damage, consult a CT licensed arborist about methods to protect the roots if fill needs to be added or soil needs to be removed within the PRZ.

Excavating

If utility or irrigation lines cannot be relocated outside the tree's PRZ, reduce root damage by requiring tunneling under the tree's root system (instead of trenching through it). Specialized equipment that blows soil away from the roots using compressed air allows utilities to be placed with very little root damage. Otherwise soil tunneling equipment can be used, reducing root damage by up to 25 percent compared with trenching.



For all digging operations, insist that exposed roots be cut cleanly to promote quick wound closure and regeneration. Vibratory plows, chain trenchers, stump grinders, and hand tools, such as saws and pruners, do a better job at this than bulldozers and backhoes.

Avoid excavating during hot, dry weather; keep the plants well watered before and after digging; and cover exposed roots with soil, mulch, or damp burlap as soon as possible.

Paving

To minimize damage, keep walkways at least 3 feet from the anticipated mature trunk.

Troubleshooting

If you see:	Potential cause:	You should:
TRUNK		
A flat-sided trunk at the base of the tree	Encircling root restricting the flow of water and nutrients between the roots and rest of the tree	Excavate to check for encircling root (p. 22)
Bark damage near the bottom of the tree	Rodent or string trimmer	Apply trunk guard/mulch to protect from future damage (p. 21, 23)
An elm or oak tree with liquid oozing from the trunk	Slime flux or wetwood	Not worry about health
BRANCHES		
An elm tree with bright yellow leaves on one or two branches	Dutch elm disease	Immediately call for advice*
Webs in the branches or webs covering the tips of branches	Fall webworm or Eastern tent caterpillar	Call for advice*
Many branch tips snipped off and laying on the ground	Squirrel damage	Call for advice*
Black clumps on branches of a cherry tree	Black knot	Call for advice*
Very little growth	Many	Call for advice*
Hole in trunk or branches	Many	Call for advice*
LEAVES		
Leaves sticky and covered with a black velvety coating (like soot)	Piercing, sucking insect and sooty mold	Call for advice*
Leaves wilted	Many	Call for advice*
Spots on leaves	Many	Call for advice*
Small leaves	Many	Call for advice*
Sparse leaves	Many	Call for advice*
Yellow or brown leaves	Many	Call for advice*
Holes in leaves	Insect feeding	Call for advice*
Bumps on leaves	Many	Not worry about health

*Call a Connecticut licensed arborist or the Connecticut Agricultural Experiment Station (CAES) for advice and possible diagnosis (next page).

Other Sources of Help

Licensed arborists, local nursery and horticultural professionals can provide good information about the health of your tree, and many communities have city foresters that may be of assistance. The following institutions and organizations can serve for answering tree health questions:

University of Connecticut
(877) 486-6271
https://plant.lab.uconn.edu/

UCONN Extension
(860) 486-3581
http://extension.uconn.edu/

Connecticut Agricultural Experiment Station
(203) 974-8500
https://portal.ct.gov/caes

Connecticut Tree Protective Association
(203) 484-2512
www.ctpa.org

Additional Sources of Information

CT DEEP Forestry	https://portal.ct.gov/DEEP
Tree Wardens' Association of CT	www.cnla.biz
CT Nursery & Landscape Association	www.cgka.org/
CT Grounds Keepers Association	www.treesaregood.org
International Society of Arboriculture	www.americanforests.org
American Forests	www.arborday.org
Arbor Day Foundation	www.treecareindustry.org https://
Tree Care Industry Association	www.fs.usda.gov
US Forest Service	www.cbyd.com
Call Before You Dig	www.eversource.com
Eversource Energy	www.uinet.com
United Illuminating	

The US Forest Service has produced a Spanish language version of the National Tree Owner's Manual. This publication is available at: https://portal.ct.gov/-/media/DEEP/forestry/urban_forestry/TOM-Spanish-2021-07-16.pdf

How to Hire a Connecticut Licensed Arborist*

When selecting an arborist, look for the following qualifications:

- **Connecticut Arborist License**
  In caring for your trees, it is important to hire the right person or company. In Connecticut, we have an "Arborist Law" (CGS 23-61a-m). This law requires that any person who provides tree care services for hire must be licensed as an arborist. It also requires that any business that provides those services be registered with the Department of Energy and Environmental Protection.

  Licensed arborists are experienced professionals who have passed an examination and meet requirements for on-going education. Arboriculture is any work to improve the condition of trees by pruning, fertilizing, cabling or protecting trees from insects or disease.

  To find a Connecticut licensed Arborist or a Registered Arborist Business, visit https://arborists.ctpa.org/.

- **Proof of Insurance**
  A reputable arborist carries personal and property damage insurance ($1 million per occurrence, $2 million aggregate) and worker's compensation insurance ($1 million). A reputable arborist also does not mind demonstrating that he or she is insured. Request certificates, and phone the insurance agency to verify. Ask if the entire job will be performed by employees of the tree care company bidding the job. If not, ask for insurance certificates from all independent contractors as well. If an arborist is uninsured, homeowners could be held responsible for damages and injuries that occur as a result of the tree work.

- **Membership in Professional Organization(s)**

  Arboricultural organizations include the International Society of Arboriculture (ISA), the Tree Care Industry Association (TCIA), the American Society of Consulting Arborists (ASCA), and the Connecticut Tree Protective Association (CTPA). Such memberships demonstrate commitment and professionalism.

Note: In Connecticut, an individual does not need an arborist license in order to plant a tree. However, post-planting care, including pruning and fertilizing, when done for hire, does require the services of an arborist.

*Adapted, with permission, from: International Society of Arboriculture. 2004. Why hire an arborist? Champaign, IL. 4p.

Additional Advice for Hiring an Arborist

- **Ask for References and Speak to Former Clients**
- **Get More than One Estimate**
- **Do Not Automatically Accept the Lowest Bid**
- **Never Pay in Advance**
- **Be Wary of Door-to-Door Sales**

  These are especially common after storms. Know that good arborists perform only accepted practices and wear safety equipment. For example, topping a tree and using climbing spikes for pruning are unacceptable. Safety equipment includes hard hats, ear and eye protection.
- **Get it in Writing**

  When will the work be started and completed? Who will be responsible for clean-up? What is the hourly rate for additional work?

Advice for Hiring a Landscape Professional

In addition to the above advice for hiring an arborist, look for the following qualifications:

- **Necessary licenses and registrations**
  If a pesticide will be used to treat for weeds, insect or disease pests, the applicator must be licensed and the business must be registered with DEEP. Visit https://portal.ct.gov/DEEP/Pesticides/Pesticide-Certification-General/Pesticide-CertificationLicensing for more information.

  Any Contracted Landscaping done on Residential Property requires that the business be registered as a Home Improvement Contractor with the Department of Consumer Protection. Visit https://portal.ct.gov/DCP/Trade-Practices-Division/What-to-Look-For-in-a-Home-Improvement-Contractor for details. This registration is not required for work done under the DEEP Arborist License or any DEEP Pesticide Application License.

- **Membership in Professional Organization(s)**
  Landscape professionals often belong to one or both of the landscape trade associations in Connecticut - the CT Nursery and Landscape Association (CNLA) or the CT Grounds Keepers Association (CGKA). Both organizations are committed to advancing the knowledge and professional skills of their members.

In the Event of an Emergency

Large branch or tree on the ground
If it is near a downed utility line, do not go near the tree! Trees can conduct electricity. Call the utility company. If it is in the street, contact the city or town. If it is in your yard, call a CT licensed arborist (p. 34). If the tree is still standing, have it assessed.

Tree or branches on utility line
Stay away from the tree! Call your utility company.

Branches broken, still hanging in the crown
Call a CT licensed arborist (p. 34) to have the "hangers" removed and to make clean cuts at a lateral branch or bud to encourage proper healing (p. 2, 26).

Ice coating and weighting the branches
Stay in a protected area, out from underneath the branches. Some limbs may break. Once the ice is gone, check for safety (p. 24). Call a CT licensed arborist if necessary. Many branches return to their original state after severe bending.

Tree hit by vehicle
If possible, get the license plate number, name, and insurance information of the driver. Document the tree's injuries with photographs. Contact a CT licensed arborist to evaluate the damage (p. 34).

Wounded trunk
Use scissors, a sharp knife or hand pruners (p. 26) to cut off any loose bark. Leave a small margin of loose bark. Monitor health (p. 24). Do not apply "wound paint."

Chemical spill around tree
Identify the chemical and the amount of the spill, if possible. Call CT DEEP Chemical Spill Response Toll-Free at 1(866) 337-7745 to report a spill. Contact a CT licensed arborist (p. 34) to remediate tree health concerns.

Root severed
Photograph and call a CT licensed arborist (p. 34) to assess safety and make treatments as necessary.

Flooding
Monitor the trunk to see if it begins to lean in one direction. Check the ground area around the roots to see if the soil or grass has lifted. If so, contact a CT licensed arborist right away for a safety assessment. Monitor the tree's health over time (p. 24). It may take a year or more for symptoms to appear.

Lightning or storm damage
Call a CT licensed arborist (p. 34) to assess safety and make necessary treatments.

Trunk nicked by lawn care equipment (weed trimmer or lawn mower)
Create a mulch ring around the tree to eliminate grass and weeds (p. 23).

Removal and Disposal

Whole Tree

⚠ **Electricity flows through branches.**
If the tree or branches are within 10 feet of utility lines, contact your local utility company for information on assistance in removal or hire a qualified line clearance company.

To remove a large tree, hire a CT licensed arborist. If you are interested in having the tree milled into lumber, visit https://woodmizer.com/us/Services/Find-a-Local-Sawyer to find someone with a portable mill in your area. You may also try contacting local woodworkers and technical schools to see if they would like the wood.

Disposing of debris:
Option 1: The CT licensed arborist can remove the wood for you.
Option 2: If you or someone you know could use the tree for firewood, ask the CT licensed arborist to cut and leave the wood for you in moveable chunks. If you do not know anyone who needs firewood, consider advertising it on community bulletin boards (e.g., at local grocery stores).

Insects and diseases are hitch hikers.
Many insects and diseases can be spread by moving firewood. To be safe, do not transport firewood to another town.
Please note: Due to the Emerald Ash Borer, wood and debris may not be moved outside of Connecticut.

Trimmings

Check with your city or town for compost sites that accept tree branches and leaves.

Leaves

If you live in the city, keep leaves out of the street to avoid clogging storm sewers and polluting water (nutrients from leaves get leached into the storm drains, which typically lead directly to lakes and rivers). Leaves can be used as mulch around your trees and in your garden beds or taken to your local compost site (Visit the CT DEEP website and search Large-Scale Organics Management for a list of leaf composting facilities). Check with your city for leaf disposal options.

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act. Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.

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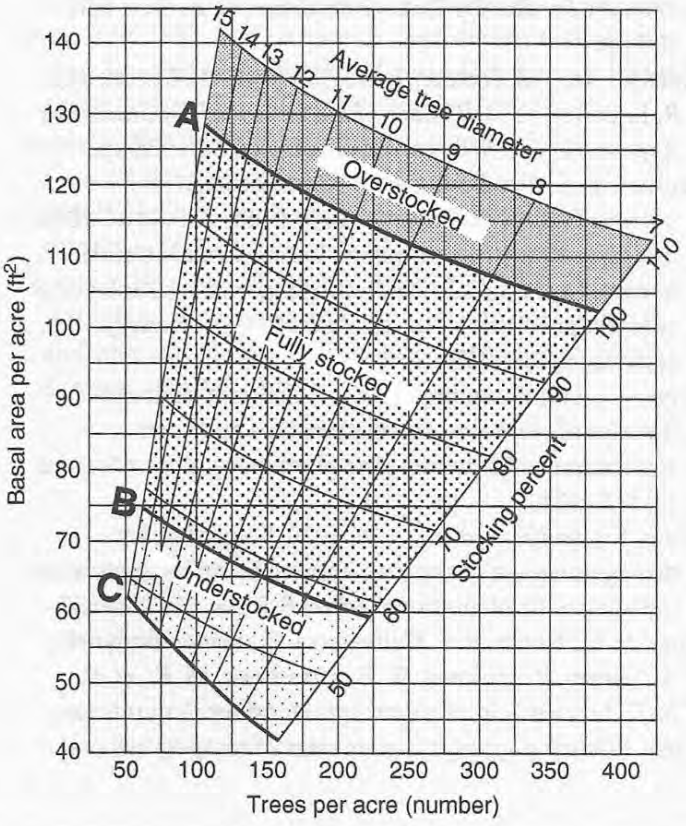
APPENDIX C – Stocking Guide

Box 22.3 The Gingrich Stocking Diagram (this example is in English units only).

The Gingrich diagram was first published in 1967 (see Fig. 1). It is a nomogram illustrating the relationship between basal area per acre, trees per acre as a measure of density, and quadratic mean diameter. The C-line demarcates the lowest stocking that a stand can be at (understocked) and still grow to attain the B-line within 10 years assuming average site quality. The B-line is an estimated point at which the stand can be at full occupancy of growing space. The A-line is the minimum tree area line for a stand considered to be at full stocking that has never been thinned. A stand that is above the A-line is considered overstocked, where tree growth is slow and mortality is high. The area between the A- and B-lines is the range of stocking where trees can fully utilize the site.

Box 22.3 Figure 1 A stocking diagram for central hardwoods (Gingrich, 1967). To use the stocking diagram, plots need to be placed in the stand to estimate basal area and number of stems over 2 in DBH. It is best to use fixed-area plots of sufficient size and number to account for stand heterogeneity. Then knowing the basal area and tree density, and positioning this point on the diagram, the average tree diameter and stocking level can be interpreted. If the point is above the B-line, then follow the average tree diameter for your stand down to the B-line, and then follow the horizontal line across to read the basal area for the B-line for that diameter. Subtracting the basal area recorded for the stand from the basal area at the B-line for the stand at that diameter, gives the user an estimate of the allowable amount of basal area that can be cut in a thinning. *Source:* US Forest Service.



This stocking guide for upland central hardwoods is read by locating the intersection of trees per acre and basal area for a stand in question and determining which area it falls into. The C-line represents stocking that will reach the B-line in 10 years. The B-line will reach the A-line within 5-8 years on the best sites and 12-15 years on poorer sites. Image from The Practice of Silviculture: Applied Forest Ecology (tenth edition).

APPENDIX D – Glossary

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

CTT: Crop Tree Thinning: Culturing individual trees with the greatest potential to produce specific benefits

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 Stream: A small stream that usually does not flow all year

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

Overstory: Upper canopy of treetops

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

Quadratic Mean Diameter (QMD): The diameter of the tree that represents the average basal area of all trees in a stand.

Regeneration: New young trees

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

Riparian Zone: the interface between land and a river, stream, or other water body. These zones include the vegetated corridors along waterways where soils and plants are influenced by the presence of water.

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

Snag: A dead standing tree

Stand: Separate and distinct natural community

Understory: Vegetation layer below the upper canopy of treetops

TSI: Precommercial thinning where trees that have little or no value are killed or removed

Water Bar: Ditches or logs placed at an angle to the slope to divert water from its downhill path

WILDLIFE IN CONNECTICUT

HABITAT FACT SHEET

Brush Piles

Definition

A brush pile is a mound or pile of appropriate woody material fashioned by piling brush and loose branches on top of a base comprised of larger logs or other natural materials.

Purpose

This practice is used to create cover for many songbirds, small mammals, reptiles, and amphibians when natural cover is limited, such as after clear-cutting. Brush piles provide areas for nesting, resting, escape from predators, and protection from harsh weather conditions.

Criteria, Considerations, and Specifications

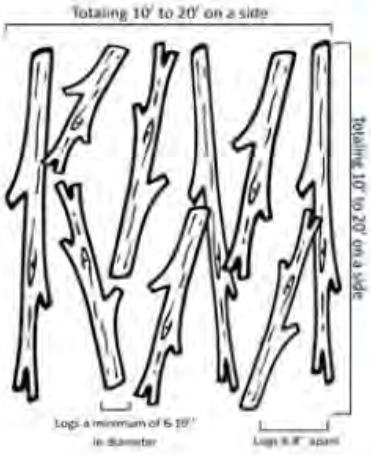
Brush piles may be built to various dimensions based on the size of available material. However, the size should range between 10 to 20 feet on a side and 4 to 8 feet high.

Materials

Brush piles can be constructed using a variety of materials. Commonly, materials left from timber harvesting or any tree-cutting activity are used. Natural features, such as rocks, boulders, and stumps, may also be incorporated.

Construction

1. Base layer:
   a. Logs at a minimum of 6 to 10 inches in diameter are laid at various angles, leaving small openings (6 to 8 inches wide) between base logs for easy wildlife access. Alternate logs to create varying heights and avoid creating parallel runways through the base layer.
   b. Logs of various lengths (that add up to 10 to 20 feet on a side) can be staggered throughout the foundation, with breaks, creating a maze-like environment.
   c. Outer logs should be closer to 20 feet in length to provide stability for the brush pile.
2. A second layer of smaller diameter logs should be laid on top and roughly perpendicular to the first base layer, in the same fashion, and repeated with increasingly smaller logs, building 1 to 3 additional layers.
3. The foundation should be covered with 3 to 6 feet of brush, using small limbs, saplings, loose brush, and pine boughs. Larger branches should cover the foundation, with smaller branches placed on top.



A second layer of logs is laid on top of and roughly perpendicular to the first layer.

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4. Brush should loosely drape over the edges, with openings (6 to 8 inches in diameter) left on the sides in several places for easy wildlife access and escape. Brush should cover the pile sufficiently so that the base is mostly covered. If available on site, add pine boughs, as the needles will persist after deciduous leaves fall off. You should not be able to see through the brush pile even after leaves have dropped from the branches.

NOTE: When constructing brush piles using mechanized forestry equipment, it is not possible to construct piles exactly as described. It is suitable if larger logs are crisscrossed on the base and covered with increasingly smaller logs and finally brush, so long as adequate spaces are left for wildlife to enter and exit the pile.

The foundation should be covered with brush, using increasingly smaller branches on top.

Placement

Several considerations should be made when placing brush piles:

- Multiple brush piles are better than one large pile, providing more opportunities for cover and escape from predators.
- Good locations include adjacent to forest openings, pastures or hay fields; within shrub thickets or fencerows; in field corners; and near stonewalls and wetlands.
- On lands with little natural cover, such as recently cleared areas, begin brush piles within 25 feet of woodland edges and build in towards the center of the habitat patch, resulting in 1 to 3 brush piles per acre, evenly distributed across the project site.
- Place near wildlife food sources, such as mast and fruit trees.
- Avoid placing brush piles on existing high quality food or cover sources.
- Avoid placing brush piles near homes, lawns, or gardens to prevent situations where wildlife could become a nuisance.
- Keep away from buildings due to flammability.
- Cultural resources, such as stone walls, can be incorporated into a brush pile; however, stones should not be moved.

Variations of Brush Pile Base

- Tree stumps still in place can be incorporated into your brush pile base. Several logs (6 to 10 inches in diameter and 5 to 6 feet long) are placed on top of and around the stump.
- Small rock piles should be staggered about 12 inches apart with each pile about 10

Add leafy crowns or pine boughs to the top of the pile.

inches high and 12 inches across to support the next layer of limbs. Existing boulders and rocks on the landscape can be piled together to provide additional den sites. Start with the largest rocks on the bottom of the stack to create hiding places between the rocks, and stack brush on top for additional cover.

Other Types of Cover

(These do not meet criteria for reimbursement through the Natural Resource Conservation Service Program.)

- Living brush pile – in a cluster of small diameter trees, cut each tree half way through at a height of 12 to 18 inches above the ground; fold treetops inwards towards other trees in groups so they rest on the ground or on top of the other half-cut trees.
- Stonewalls – may be incorporated into the brush piles base; brush should be placed against the wall with similar dimensions and distribution to brush piles created in an open space.
- When harvesting trees, leave the crowns of the largest trees (e.g. an oak treetop) for wildlife cover.
- Windrowed brush piles – typically these linear brush piles can best be created after a forestry or tree removal operation. As with other brush pile creation, larger materials should be placed on the bottom at various angles with subsequently smaller material on top. Avoid packing the logs tightly, as this will eliminate any openings for wildlife to enter and exit the linear pile. Windrows should range from 10 to 20 feet on a side and 6 to 8 feet high. Windrows should have breaks built into them every 50 to 100 feet to provide travel lanes for wildlife.

Construction of a brush pile using mechanized forestry equipment.

Operation and Maintenance

- Monitor condition and/or usage of the structure.
- Conduct needed maintenance of the structure, such as periodically adding new material to the top of the pile.

Additional Notes

Brush piles are not permanent. New brush needs to be added over time or new piles may need to be constructed. Rot and decay are natural processes and may attract more insects, providing additional food sources.

Do not use materials that contain toxic substances (i.e. pressure treated lumber/posts, creosote railroad ties, lead painted surfaces, tires, etc.). These substances can cause wildlife mortality either through contact, consumption, or inhalation.

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www.ct.gov/deep/wildlife

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PRESERVING TREES FROM EMERALD ASH BORER

The emerald ash borer (EAB) is a small (1/3 to ½-inch), bright metallic green beetle (Fig. 1), in the beetle family Buprestidae, native to eastern Asia. Since its detection in the Detroit, Michigan area in 2002, it has rapidly expanded its range through the Midwest and Northeast, killing hundreds of millions of trees and taking only about three years from its first detection in Connecticut (in 2012) to being found throughout the state (see http://www.emeraldashborer.info). The EAB only attacks true ash, species in the Genus *Fraxinus*, such as green ash, white ash, and black ash, and a close relative of ash, the white fringetree, *Chionanthus virginicus*. Range expansion involves flight by beetles (a few miles per year) assisted by unintended longer distance transport of larvae infesting firewood or nursery stock. EAB is now so broadly distributed that the federal government no longer treats it as a regulated pest. This guide summarizes the experience from researchers and municipal arborists regarding the dynamics of infestation and the ability to preserve valued ash trees.

EAB adults emerge and are active in June and July. Female beetles lay eggs in cracks in the bark on ash. The larvae feed on the inner bark creating serpentine galleries (Fig. 3) that eventually girdle and kill the tree. A heavy infestation can kill the tree in 3-5 years. Their distinctive sinuous galleries get larger as the larvae grow. Fully developed larvae are about 25 – 32 mm long (~ 1 inch), and overwinter doubled over into a J-shape prior to pupating in the spring. Larvae are called flatheaded borers for the greatly expanded but flattened thorax (Fig. 2), in which the head is mostly hidden. They typically require 1 – 2 years to complete development while consuming phloem tissues and outer sapwood under the bark. Newly molted adults chew a D-shaped hole (Fig. 4) to exit the tree.

Ash may still be an important urban tree species in some communities. While parasitic wasps are being reared and released in Connecticut for biological control, it is still too early to know what impact they may have in controlling EAB: it is hoped that insecticide treatment programs currently necessary for protecting trees may no longer be necessary once biological control becomes fully established. Urban ash trees are often under varying degrees of decline from a disease and/or other environmental stressors, which predispose them to be killed quickly by EAB. During the triage process for planning tree removals, communities and individual homeowners need to consider prompt removal of dead or dying ash trees,

as dead trees start shedding branches within about nine months. Removal of trees before they are completely dead is safer to the working arborist; once EAB have caused crown dieback in excess of 30% and there are epicormic shoots at the base of the trunk, it is not likely that the tree can be saved. However, trees can be treated with insecticides to protect valuable, uninfested trees or control EAB in lightly infested trees before severe injury symptoms are observed.

Individuals and communities should plan measures they are willing to take to manage their ash resources. Each tree should be analyzed for its value and for the relative cost of removal versus preservation. Ultimately, a plan can be used to optimize the number of preserved trees and to spread out the costs related to EAB infestation over a longer and more manageable interval of time.

Step 1: Inventory the quantity and quality of ash trees on your property. A useful tree value calculator is available online (http://extension.entm.purdue.edu/treecomputer/). Consider a triage process: the following are characteristics that range from placing high value on preserving a tree to considering the tree a current liability. Are the ash trees of historical or special aesthetic value? Does the tree provide shade that is important for reducing air conditioning expenses? Are there other species of trees that would be better suited for the site? Does the tree have structural defects or is already in decline for other reasons that would signal considering removal? Foresters have calculated that benefits provided by an ash tree from shade, reduced need for air conditioning, cleansing the air of particulate matter, and limiting stormwater runoff in an urban environment can be greater than the cost of protecting that tree with a systemic insecticide.

Step 2: Assess the options suitable for preserving trees. Trees can be kept healthy, with judicious and timely use of various insecticides. Options available include contact insecticides (bifenthrin, carbaryl, cyfluthrin, or permethrin) to kill adult beetles as they arrive on the treated plant surfaces, and systemic insecticides, which move throughout the tree in sap to protect phloem from larval feeding. Contact insecticides are relatively inexpensive and are effective, but usually require hiring arborists with hydraulic sprayers, for which application costs are relatively high. Spraying can lead to hazards to non-target organisms from spray drift; for example, spray landing on open flowers is lethal to visiting pollinators, including honey bees. Contact insecticides can be expected to perform moderately well irrespective of the tree size, if the entire tree can be sprayed. Treatment programs with contact insecticides usually involve two sprays, one in late-May and another in early July. Only contact insecticides (not applied during bloom!) should be considered for protecting white fringetrees, as otherwise pollinators could be adversely affected by systemic insecticides present in their nectar.

Systemic insecticides include (1) imidacloprid, which is a relatively inexpensive insecticide easily applied as a basal soil drench, (2) dinotefuran, with intermediate cost, applied as a basal soil drench or trunk spray, (3) clothianidin, similar in mobility to dinotefuran, but with longer insecticidal effects (not labeled for forest use) or (4) emamectin benzoate, which must be applied via trunk injection. The first three products principally work by killing adults that feed on foliage before laying eggs; emamectin benzoate also kills larvae feeding within the tree. Systemic insecticides are diluted within the volume of

the tree's living tissues, and so effectiveness can decrease as tree size increases, unless the dosage of insecticide is adjusted to compensate for this effect. A Connecticut law passed in 2016 requires that most of these systemic insecticides be applied by professional arborists. One registered formulation of emamectin benzoate is not a restricted use pesticide and could be applied by a suitably equipped homeowner to their own trees. Imidacloprid moves relatively slowly into trees and should always be used preventively; it can be effective if applied in the fall or from April to early May. Springtime application is slightly more effective. Dinotefuran and clothianidin are much more mobile within trees. Dinotefuran has effectively been used later in the season after infestations have been detected. To be continuously effective, imidacloprid, clothianidin, or dinotefuran must be applied once per year. Emamectin benzoate has been the most effective active ingredient to target larvae within trees; a single application can be effective for 2 – 3 years, even on large trees.

The impact of systemic insecticides on pollinators, especially of native and honey bees, is an important consideration, because ash produces abundant pollen which is avidly harvested by bees in April. The risk to bees from ash trees treated with systemic insecticides has not been quantified. Risk assessment will require knowledge of the insecticide concentration in pollen, the proportion of ash pollen in the bees' diet, and the sensitivity of various stages of bees and the entire colony to these insecticides. Application of the systemic insecticide with the shortest residual (dinotefuran) *after* ash trees have bloomed should minimize the exposure of bees to insecticides and consequently their risk. Imidacloprid and emamectin benzoate are known to be present in significant concentrations in the year following an application. These products and clothianidin may pose higher risk to bees than post-bloom applied dinotefuran, especially where systemically treated trees constitute a significant early-season pollen source.

Treatment guidelines may change with new research results. To stay informed of the latest information, please visit www.emeraldashborer.info

Fig. 1: Emerald Ash Borer adult

Fig 2: EAB larvae

Fig 4: D-shaped hole in bark

Fig. 3: S-shaped galleries formed by larvae

Photographer: David Cappaert: all photos used with permission.

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Beech Leaf Disease: Management Options

Beech leaf disease (BLD) is a serious threat to our native American beech trees and ornamental European and oriental beeches. The disease has spread quickly from Ohio since first being detected in 2012. It is now found in 12 states and the province of Ontario. It's infecting beech in all New England states except Vermont. It was first found in CT in 2019, and in RI and MA in 2020 (Fig. 1). The American beech, *Fagus grandifolia*, is a foundational tree species in several important eastern forest types, and critical for the hard mast (beechnuts) eaten by wildlife and shade they provide.

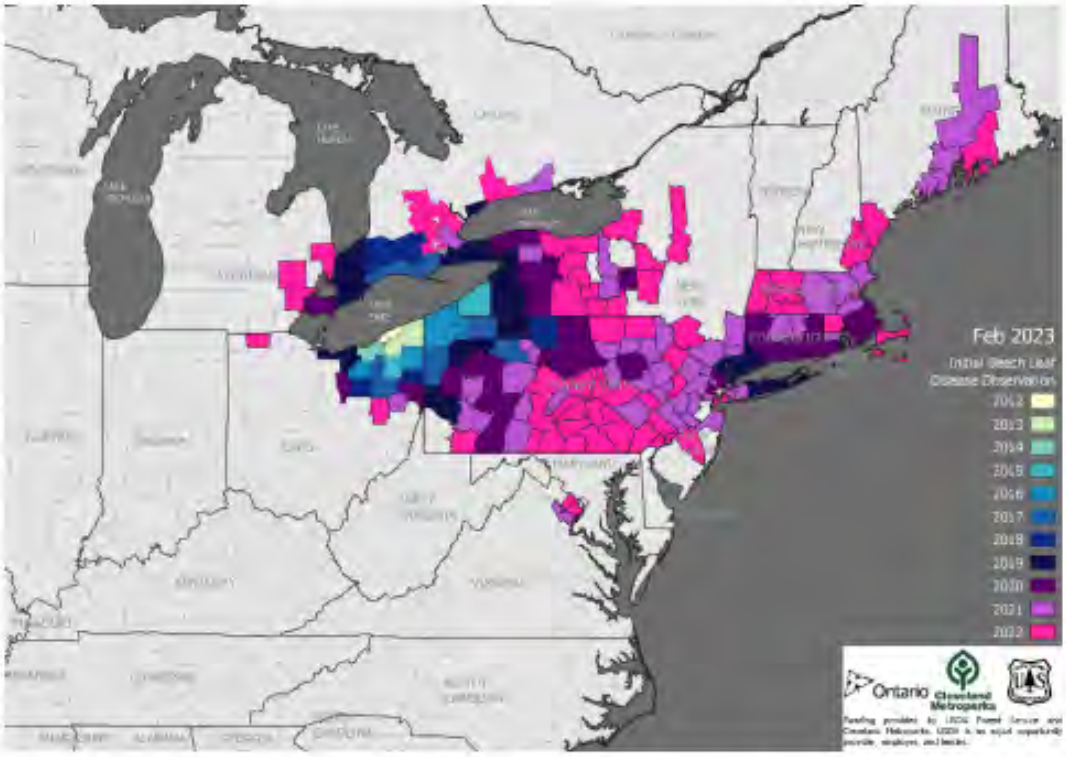

Fig. 1. Range expansion of beech leaf disease from 2012 to 2023.

Fig. 2. Immature migrating female of *Litylenchus crenatae* ssp. *mccanni*. Photo by DeWei Li, CAES

Beech leaf disease is caused by a foliar nematode, *Litylenchus crenatae* ssp. *mccannii* (Fig 2.). Nematodes are microscopic worms that vary greatly in lifestyle and habitat, and not all are parasitic. We don't know where the nematodes came from, but growing evidence supports the hypothesis that this species is not native to North America. It has spread quickly, partly though rain splash, and likely also by hitchhiking on birds, squirrels, and insects. Peak emergence of nematodes migrating from leaves to buds occurs about the same time that beechnuts are ripening, which provides an opportunity for migrating nematodes interact with animals that come to feed on these nuts. We do know that the nematodes spend the winter in beech buds, that beech leaves emerge fully symptomatic in the spring, and that no further symptoms appear during the growing season. Therefore, management of this disease needs to either prevent nematodes from entering the buds or prevent nematodes that enter buds from inducing changes in leaf development.

SYMPTOMS

It's easy to determine if American beech trees are infected with BLD (Fig. 4). In the spring when new leaves are emerging from buds, infected leaves will have some dark bands between leaf veins, or the leaves will be very crinkled, smaller, and leathery. In severely infected trees, some buds won't open because the buds were killed. Banded leaf symptoms can best be seen by backlighting infected leaves against the sky.

Fig. 4. Symptoms on American beech. Left, Leaf banding symptoms; middle, crinkled leaves; right, dead buds.

Symptoms are less obvious on European beech trees (Fig. 5). Some leaves will be banded, but many of the leaves will look tattered or distorted.

Fig. 5. Symptoms on European copper beech. Left, Tattered leaves; right, banded leaves.

On heavily infected trees many overwintering buds will be killed, and severely damaged leaves fall off soon after emerging in May. In late May or early June, many American beech trees produce new, second flush leaves in response to defoliation. These leaves are formed in newly produced buds. Second flush leaves don't have nematodes and do not show symptoms of BLD because they form in the absence of BLD nematodes. The new leaves are pale and thin when compared with normal, healthy leaves, and usually lack the toothed margins characteristic of first-flush leaves (Fig. 6).

Fig. 6. Refoliated (second flush) leaves are paler and less robust than normal, healthy beech leaves.

In Ohio, researchers are seeing some American beech trees, particularly younger understory trees, die in 6 – 10 years after infection. While we are seeing much faster progression of disease and decline in the Northeast, actual mortality has not yet been documented in Connecticut. However, we expect that some trees will succumb in as little as four years after the first appearance of symptoms.

MANAGEMENT

What can be done about BLD? In 2017, Ohio researchers associated with Davey Tree Expert Co., Cleveland Metroparks, and ACRT Services started treating the soil around small beech trees (2 - 4 inches in diameter) with a phosphite product sold as a potassium fertilizer. Such potassium phosphite and potassium polyphosphite fertilizers are made by several companies. The researchers

applied product twice each year and got encouraging results after the first year. Treated trees were significantly healthier than untreated control trees with respect to reduced symptoms of leaf banding, defoliation, and dieback of twigs and branches. With annual treatments, trees have remained healthy for five years. Fewer nematodes were found in the leaves of treated trees than in the control trees. Our hope is that we will see similar results in New England.

Phosphite products are known to stimulate plant defenses. Earlier research demonstrated that phosphites can interrupt gall formation by root nematodes, in which the plant cells modified to form the gall benefit nematode feeding. The positive results from the OH studies are consistent with the recent discovery by Dr. Paulo Viera at USDA that nematodes feeding within the bud cause tissue changes to initiate formation of a leaf gall. By interrupting this process, phosphite products can maintain plant health, even though nematodes may still survive within leaf tissues.

Many phosphite products are sold as fungicides such as Agri-FOS, Fosphite, Reliant, Fungi-Phite, and Prophyt. Beech trees treated with either a fertilizer formulation or a product labeled as a fungicide should respond similarly. When using a fungicide formulation, you may not apply at a higher dose than allowed on the label. However, multiple applications of products labeled for plant protection use should reach effective concentrations of phosphite in tree tissues. To use a phosphite product, plan to make at least two applications between the months of May and August. Mix 2 fl. oz. of phosphite product plus 14 oz. of water per inch DBH (diameter at breast height). So, a 4-inch diameter tree will require 8 oz. of phosphite fertilizer in 48 oz. of water. Pour this around the base of the tree (Fig. 7). If the soil is dry, moisten the soil first with water so that the solution can penetrate the soil.

Fig. 7. Drenching a phosphite product into soil at the base of a beech tree.

Research in Ohio was performed on small (2-4" diameter trees) trees. The rate of 2 oz. of phosphite fertilizer per inch DBH may not be enough to improve the health of larger beech trees. Bigger trees have more foliage than smaller trees, and to account for this difference you may need to increase the number of applications. Please recognize that potassium phosphate is a salt, which may damage roots if present in excessive quantities or under drought conditions. Concern over overloading the soil with salts implies that greater quantities of product should not be concentrated near the root

flare but should be applied over a larger area. Otherwise, we may damage the tree with too much fertilizer.

A fungicide/nematicide called Broadform, which has an ornamentals label, kills nematodes when sprayed on beech leaves – a job best left to professional arborists. Here are several considerations for deciding whether Broadform is an appropriate option:

(1) Are there untreated beech trees nearby? Fluopyram sprayed on the foliage does not enter the buds. If nematodes migrate from neighboring untreated trees to the buds, where the damage occurs, then a fluopyram spray will be ineffective. Therefore, fluopyram should only be considered for treating trees isolated from other, untreated beech trees.
(2) If the tree is less than 4 inches in trunk diameter, then the phosphite treatment can be effective as a stand-alone treatment, whether or not there are other untreated trees nearby.
(3) If there are any bodies of water nearby, or hardscape leading to storm drains, then fluopyram products are inappropriate. Fluopyram is very toxic to aquatic organisms.
(4) Can the foliage be sprayed? If the tree is very tall or if it overhangs a neighbor's property, it may not be possible to spray the foliage.

If appropriate, fluopyram application(s) should be made between late May and late August. It's currently unknown if more than one application of fluopyram is needed. Monitoring for the continued presence of nematodes by extracting them in water from leaves is a convenient method to determine whether foliar sprays with fluopyram have been effective. If live nematodes are not detected following overnight leaf extraction, then further sprays may not be warranted.

Another important concern is pesticide resistance. It seems likely that BLD nematodes will develop resistance to fluopyram if this product is overused.

How to test for nematode presence using bud or leaf extraction

Step 1. Preparing the sample for extraction

1a. During the dormant season, overwintering buds can be collected and tested for the presence of nematodes. To test buds, remove six buds from around the perimeter of a tree. With a needle, forceps (tweezers), probe, or fine scissors (nail scissors work well), cut the bud lengthwise and tease the scales and developing, tiny leaves open. Place the buds in a small shallow clear plastic or glass dish and cover with water. Proceed to Step 3.

1b. During the growing season, nematodes that cause BLD can be detected from leaves between late July through leaf fall. Attempts to extract nematodes before mid-July are unsuccessful, even though nematodes are present in the leaves! Pick several symptomatic leaves. Vigorously rinse the leaves off with a stream of water to remove any surface-dwelling nematodes. Pat the leaves dry. Manually tear out the symptomatic areas of leaves from between the veins. Shred these symptomatic portions into small pieces (1 cm square).

Step 2. Conducting the extraction

Submerge the sample from Step 1b into a shallow layer of water in a dish or pan in a cool location. Aluminum pie pans work well. The objective is to have a high surface area to volume relationship, so that the nematodes have enough oxygen to remain active. Hold the samples overnight.

Step 3. Observe the results

Remove the plant material from the water with forceps. Extracted nematodes can be seen easily with good magnification, either by using a dissecting microscope or a USB microscope (the cost is about $60 from online retailers). They appear as highly mobile, thread-like animals (Fig. 2) with sinuous movements in the water. It is easiest to see them when the liquid containing them is held over a dark surface and the liquid is illuminated from the side.

Note: If a fluopyram treatment is effective and samples are evaluated within weeks of spraying, dead nematodes may be extracted with the procedure given above. They can be so numerous that dead nematodes can spill out of torn leaf tissue.

Note: Product trade names are used for convenience, and not to promote a product. Always read and follow pesticide label directions. The label is the law.

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Spotted Lanternfly (*Lycorma delicatula*)

The Spotted Lanternfly (*Lycorma delicatula)* is an invasive planthopper that is native to China, India, and Vietnam. This insect was first detected in the United States in Pennsylvania in 2014. Since this initial detection, the Spotted Lanternfly has spread and established in multiple surrounding states, including Connecticut. This insect is a nuisance pest for homeowners and poses a threat to Connecticut's grape industry.

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Description:

Spotted Lanternfly (SLF) nymphs have four instar (developmental) stages and can usually be seen between April and October. The first through third instar nymphs are black with white spots; in the fourth instar stage nymphs are red (pictured right).

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Adults can be seen July through November and are generally about an inch long and half as wide when their wings are closed. Their forewings are a tan/grey color with black spots. Their hind wings are bright red with the same black spots, though the hind wings are usually not visible when the insect is feeding or at rest. Spotted Lanternflies have yellow abdomens with black banding.

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Spotted lanternflies lay their eggs between October and December, and the egg

masses can be found through late spring when the eggs start to hatch into nymphs. The egg masses are a discreet gray/brown color and are typically covered in a waxy coating that looks similar to clay or mud.

Emelie Swackhamer, Penn State University, Bugwood.org

Hosts:

The primary host for SLF is the Tree-of-Heaven (*Ailanthus altissima)*. SLFs have a number of other host plants including, but not limited to, grape, hops, apple, maple, walnut, and willow. SLF nymphs are more likely to feed on a wide variety of host plants, whereas adults tend to be more selective and will usually feed only from *A. altissima.*

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Damage:

SLF is considered a nuisance pest for homeowners and residents in areas of infestation. The insects stress plants they feed from by sucking sap through their piercing-sucking mouthparts. They also excrete honeydew which encourages the growth of sooty mold and attracts other insects. We encourage Connecticut residents who see SLF to report their findings at Connecticut Spotted Lantern Fly (SLF) Reporting (arcgis.com).

Richard Gardner, Bugwood.org

Information Sources:
Spotted Lanternfly, *Lycorma delicatula*
https://www.invasive.org/browse/subinfo.cfm?sub=77293

https://www.aphis.usda.gov/publications/plant_health/alert-spotted-lanternfly.pdf

November 2024

UCONN UNIVERSITY OF CONNECTICUT EXTENSION

CONNECTICUT INVASIVE PLANT WORKING GROUP

INVASIVE PLANT FACTSHEET

Control:

Tree-of-heaven *(Ailanthus altissima)*

MECHANICAL CONTROL: Due to its extensive root system and the ability to aggressively sucker and resprout, eradication of tree-of-heaven is extremely difficult. **The correct timing of the treatment, and follow-up maintenance during subsequent years, are critical to eradication success.**

- **Young seedlings** can be pulled by hand, most effectively when the soil is moist. Care must be taken to remove as much of the entire root system as possible, as broken root fragments will re-sprout. Once plants develop a significant taproot, which can occur within 3 months, they become very difficult to remove. Seedlings can be easily confused with root suckers, which are nearly impossible to pull by hand.
- **Larger trees** may be cut at ground level with power or manual saws. Cutting is most effective when trees have begun to flower (June-early July). A cut or injured tree-of-heaven may send up dozens of root sprouts. At least two cuttings per year may be necessary (one early in the growing season and one late in the growing season) to significantly weaken the plant. Although plants may not be killed after cutting, seed production will be inhibited and vigor will be reduced. **If the cutting process is repeated for many years,** plants will be severely stressed and will likely eventually die.
- **Girdling of the tree trunk** may also be an effective method to reduce vigor or kill large trees. A cut through the bark, approximately 6" above the ground, and cut completely around the trunk, will kill the top of the tree. However, re-sprouts are common, and may require follow-up treatments for several years.

CHEMICAL CONTROL: Follow label directions when using all chemical treatments. **Below recommendations may require the procurement of a professionally licensed applicator.**

- A foliar spray of glyphosate (after mid-August) or a basal bark application of triclopyr (year-round; best in summer) may be effective. Systemic herbicides are most effectively applied in mid- to late summer (until the onset of fall color), when the tree is moving carbohydrates to the roots. Herbicide applications made outside this late growing season window will only injure above-ground growth. Following treatment, repeated site monitoring and treatment of signs of regrowth is critical to prevent reinfestation.
- **Herbicides applied to foliage, bark, or frill girdles are effective** at controlling tree-of-heaven. Note that cut stump herbicide applications encourage root suckering and are not generally recommended without repeated follow up treatments. Apply all herbicide treatments after July 1, up until the tree begins to show fall color.
- **Tree-of-heaven tends to be more susceptible to triclopyr** than to glyphosate, especially prior to late summer. Where permitted, foliar sprays are effective once the leaves are fully expanded. For larger trees, three approaches are possible: 1) Girdle the tree (see description above), and apply triclopyr in the cut around the trunk; 2) Cut down tree and apply triclopyr into the freshly cut surfaces of the stump; or 3) Cut down tree and spray re-sprouts before they get too tall to correctly spray the top surface. **Extension.UMD.edu has more in-depth chemical control information.**

Well-established tree-of-heaven stands are only eliminated through repeated monitoring and control efforts. Initial treatments often only reduce the root systems, making follow-up measures necessary. **Persistence is the key to success.**

Distribution:

Tree-of-heaven is very common in the Midwest, lower northeast, as well as the west and southwest coast. The plant's ability to thrive in poor soils has allowed for it to spread throughout much of the US.

EDDMaps. 2020. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org.

Other Facts and Background:

Tree-of-heaven is native to China; it was first introduced into the U.S. in the Philadelphia area in 1784. Spotted Lanternfly, an invasive pest, is particularly attracted to tree-of-heaven, making this plant a concern for multiple reasons.

Funds to support the creation of this document were provided by the Crop Protection and Pest Management Extension Implementation Program [grant no. 2017-70006-27201/ project accession no. 1013777] from the USDA National Institute of Food and Agriculture.

USDA NIFA

United States Department of Agriculture National Institute of Food and Agriculture

SOURCES: cipwg.uconn.edu; extension.psu.edu; cce.cornell.edu; Maryland DNR; nature.org

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Tree-of-heaven *(Ailanthus altissima)*

By Victoria Wallace, Alyssa Siegel-Miles, and Klaudia Sowizral
UConn Extension

Identifying Features:

- **OVERVIEW:** Tree-of-heaven grows quickly and can ultimately **reach up to 80-100'** in height (*Figure 1*). **Allelopathic** - chemicals in plant leaves, roots, and bark can limit or prevent the establishment of other plants.
- **LEAVES:** Pinnately compound (central stem with leaflets attached on each side). Overall leaf ranges in size from 1-4' in length. Each leaf has 11-41 lance-shaped leaflets, with **smooth margins (edges)** (*Figure 2*). One to two protruding bumps, called **glandular teeth**, are at the base of each leaflet. When crushed, the leaves and all plant parts give off a **strong, offensive odor**.
- **STEMS:** Alternate on the tree, stout, greenish to brown, and lacking a terminal bud. Stems have **large V- or heart-shaped leaf scars**. **Fuzzy, reddish-brown twigs**, which easily break to expose the large, **spongy, brown center**, or pith (*Figure 3*).
- **BARK:** Smooth and green when young, eventually turning light brown to gray, resembling the skin of a cantaloupe (*Figure 4*).
- **FLOWERS/FRUIT:** Flowering occurs in late May through early June. **Fruits (samaras**, *Figure 5*) **hang in clusters**, turn from green to dull orange/brown color, and are wind dispersed. Trees are either male or female (dioecious).
- **REPRODUCTION/SPREAD:** Female trees are prolific seeders, with the potential to produce more than 300,000 seeds annually. Sprouts as young as two years of age are capable of producing seed. **Aggressive root suckers** also extend the spread as far as 50' from the parent tree, creating **dense colonies** (*Figure 6*) of established trees.
- **Correct identification is critical**; some native trees look similar, including staghorn sumac and walnuts. Staghorn sumac is distinguished by its *size* (10-20'), *serrated* leaf edges, and upright clusters of small fuzzy fruits. Walnuts produce large nuts and leaves lack glands and foul odor.

Habitat:

Tree-of-heaven is not shade tolerant. It is particularly invasive in urban landscapes, right of ways, roadsides, and woodland edges. It establishes quickly, colonizing *primarily* disturbed and neglected areas. The plant is resistant to pollution, can tolerate very poor soils, and can even grow in cracks in pavement, building foundations, and other human-created habitats.


Figure 1.


Figure 2.

Figure 3.


Figure 4.


Figure 5.


Figure 6.

From top: 1) Mature tree of heaven; 2) close up of leaves; 3) spongy brown pith (Photo by Dave Jackson, Penn State Extension) 4) bark (Photo by Ryan Davis, Alliance for the Chesapeake Bay 5) fruit - samaras (photo by Chuck Bargeron, University of Georgia, Bugwood.org); 6) infestation of young plants. Photos by Alyssa Siegel-Miles except where noted.

For more information: ipm.uconn.edu and cipwg.uconn.edu or contact: Victoria Wallace, victoria.wallace@uconn.edu, (860) 885-2826

Glossy buckthorn

Rhamnus frangula / Frangula alnus

Fact Sheet

NH Department of Agriculture, Markets & Food, Division of Plant Industry, 29 Hazen Dr, Concord, NH 03301
(603) 271-3488

Common Name: **Glossy buckthorn** Latin Name: ***Rhamnus frangula / Frangula alnus***
New Hampshire Invasive Species Status: **Prohibited** (*Agr 3800*) Native to: **Japan**


leaves (spring)


Glossy buckthorn invasion


Sapling (summer)


Flowers (spring)


Roadside invasion of saplings


Fleshy fruits (fall)


Gray bark w/ lenticels (Summer)


Emodin in berries - effects to birds


Fall foliage (Autumn)

Description: Deciduous shrub or small tree measuring 20' by 15'. **Bark**: Grayish to brown with raised lenticels. **Stems**: Cinnamon colored with light gray lenticels. **Leaves**: Alternate, simple and broadly ovate. **Flowers**: Inconspicuous, 4-petaled, greenish-yellow, mid-May. **Fruit**: Fleshy, 1/4" diameter turning black in the fall. **Zone**: 3-7. **Habitat**: Adapts to most conditions including pH, heavy shade to full sun. **Spread**: Seeds are bird dispersed. **Comments**: Highly Aggressive, fast growing, outcompetes native species. **Controls**: Remove seedlings and saplings by hand. Larger trees can be cut or plants can be treated with an herbicide.

General Considerations

Glossy buckthorn can either grow as a multi-stemmed shrub or single-stemmed tree up to 23' (7 m) tall. Leaves are deciduous, simple, and generally arranged alternately. Leaves are dark-green and glossy above while dull-green below. The leaf margins are smooth/entire and tend to be slightly wavy. Flowers are small, about ¼" and somewhat inconspicuous forming in May to June. They develop and in small clusters of 2-8. Fruits form in mid to late summer and contain 2-3 seeds per berry. In the fall the foliage turns a pale yellow and persists long after most native plants have dropped their foliage.

It is also an alternative host to alfalfa mosaic virus; and crown rust (*Puccinia coronata*) fungi that causes oat rust disease. It has also been linked as a host for the soybean aphid.

Glossy buckthorn is becoming more widespread throughout New Hampshire being spread mainly by frugivorous birds and small mammals. The greatest negative affect of both glossy and common buckthorns is their production anthroquinone, a metabolite occurring in the fruit, bark, and roots. Since berries are essentially the only portion of the plant utilized for food, wildlife foraging in the fall can be exposed to high doses of anthroquinone. Anthroquinone, once ingested, is metabolized into emodin, a laxative. Emodin can have paradoxical effects: in high doses it acts as a cathartic (resulting in moderate to severe diarrhea), whereas at low concentrations/doses it causes retention of stomach/gut contents, both of which cause nutritional deficiencies.

Glossy buckthorn is also one of the first species to invade a forested site where tree and shrub layers have been removed or altered allowing greater levels of light to penetrate to the forest floor. When wildlife that has been feeding on buckthorn fruits seek cover in natural woodland habitats they can create an immense seed bank that lays dormant awaiting for optimum conditions to allow the seeds to germinate. Once they sprout, they grow rapidly and outcompete the desirable forest species allowing it to becoming dominant. Fortunately, Glossy buckthorn seed germination rate is very high and most seeds (in the seed bank) will germinate the first year whereas the second year seedling establishment is significantly diminished.

Control Options

See the following control guides: Integrated Pest Management (IPM) for Woody Plants or the Control of Invasive Species by Numbers

Cutting mature Glossy buckthorn plants down without treating or removing the rooting system will not kill the plant, it will just promote extensive sucker sprouts to develop, which can make the plant stronger.

Glossy buckthorn **Rhamnus frangula/Frangula alnus**	
Plant Type	Shrub
Habitat Type	Forests, fields, roadsides, wetlands
USDA Hardiness Zone	3-7
Rooting Structure	Fibrous, shallow and extensive
Environmental Impacts	Contains levels of anthroquinone, which when ingested is metabolized into emodin, a laxative.
Wildlife Impacts	Nutritional deficiencies in birds and small mammals
Leaf arrangement	Alternate
NWI Ranking	FAC
Soil Type	
Soil pH Range	?
Light Requirements	Prefers partial to full sun, shade
Growing Season	
Growth Rate	2 to 4 feet (0.6-1.2 m) per year
Mature Height	10 ft. (3m)
Life Span	Moderate
Reproductive Age	2 years
Flowering Period	April-June
Flower Type	Dioecious
Pollination	Insects
Seed Set	July - August
Seed Per Plant	15,000 -54,000
Scarification Required	No
Cold Stratification	Yes
Seed Longevity	2-6 years
Seed Germination Rate	91%
Seedling Density	?
Other Propagules	Layering, suckering
Dispersal Vectors	Wildlife, water

Sources

Mehrhoff, L., 2001. Invasive Plant Atlas of New England, Catalog of Species, http://www.eddmaps.org/ipane/ipanespecies/shrubs/frangula_alnus.htm

USDA Forest Service invasive species website: http://www.fs.fed.us/database/feis/plants/shrub/fraaln/all.html

Invasives.org: http://www.invasive.org/browse/subinfo.cfm?sub=5649&desc=17

Bugwood: http://wiki.bugwood.org/Frangula_alnus

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INVASIVE PLANT FACTSHEET

Asiatic bittersweet *(Celastrus orbiculatus)*

By Victoria Wallace, Alyssa Siegel-Miles and Klaudia Sowizral
UConn Extension

Identifying Features:

- **OVERVIEW:** Deciduous woody vine that climbs, suffocates and strangles other plants. Vines can grow up to 60 ft tall and 4 in. in diameter (Figure 1). Also known as Oriental bittersweet.
- **LEAVES:** Alternate, 1-4 in. long, elliptical to circular (Figure 2). Pointed or round tip, bluntly toothed margins, glossy (not hairy). Yellow in autumn.
- **STEMS: Green when young** (Figure 3), maturing to tan. Climb for support, lack tendrils, and have obvious **lenticels** (raised pores). Bark is tannish and furrowed.
- **FLOWERS:** Small and greenish (Figure 3), blooms in May-June. Male and female flowers usually occur on separate plants. Flowers grow among the leaves at leaf axils (in contrast to native bittersweet's flowers/fruit, which are found only at twig tips).
- **SEED/FRUIT:** Small, globose, with a green casing that matures to yellow; casing splits open to reveal red berry-like fruit (Figure 4). Fruit is poisonous to humans, but eaten and dispersed by birds. Fruit persists through winter.
- **ROOTS:** Orange roots that sucker aggressively, especially when the plant is cut at the soil line or pulled without removal of all roots.
- **REPRODUCTION**: By seed. Also spreads vegetatively by spreading underground roots that form new stems.

Habitat:

Asiatic bittersweet grows in a wide variety of habitats, including rocky slopes, grasslands, beaches, and flood plain forests. Although it thrives in full sun locations, seedlings are extremely shade-tolerant. It is most commonly found in open woodlands, abandoned fields, forest and woodland edges, and roadsides, where Asiatic bittersweet can outcompete other vegetation, twining around and strangling trees (Figure 5).


Figure 1.


Figure 2.


Figure 3.


Figure 4.


Figure 5.

From top: 1) mature twining vines; 2) unripe fruit and foliage; 3) foliage and stems close up with emerging inconspicuous flowers; 4) mature, split open fruit; 5) bittersweet has overwhelmed and strangled these trees. Photos by Alyssa Siegel-Miles.

Control:

MECHANICAL CONTROL:

- Seedlings/very young plants can be pulled or removed. **Routine monitoring for seedling emergence** is critical. Seedlings are easiest to remove when the soil is moist and the population is small. Pull steadily and slowly to minimize soil disturbance. Tamp down the soil after plants are removed.
- **Bittersweet's deep root system** often makes pulling or torching impractical for any plant larger than a seedling. It is not recommended to pull established plants or cut them at the soil line, as this action stimulates the roots to resprout, forming new (clonal) plants and intensifying the infestation.
- **Repeated cutting of bittersweet at 1-2 ft**. above the soil line exhausts the plant's energy reserves. Plants will resprout from the nodes below the cut rather than from the soil line. Cut at 2 ft for the first cut; subsequent cuts may be at 1 ft. Repeated cutting (at least 1-3x/year, for multiple years, depending on the size of the plant) at the 1-2 ft. line weakens the plant to the point that a small to medium sized plant may be easily pulled from the soil. This cutting process also **reduces the vine's ability to climb and wrap itself around trees and shrubs.** Cut vines that are left hanging in the canopy will eventually deteriorate. Commitment and follow through are required to achieve control. Mechanical control may need to be combined with chemical controls for larger plants or larger populations.

Figure 6. This bittersweet has resprouted after it was cut at the two-foot line. Cutting at this height prevents the plants from forming suckers from the roots and weakens the plant over time.

CHEMICAL CONTROL: Follow label direction when using all chemical treatments.

- Glyphosate or triclopyr can be **painted on cut stems in late summer or applied as foliar sprays**. Glyphosate is most effective for cut surface treatment while plants are fully leafed and actively growing. When using a non-selective foliar spray, care must be taken to avoid injury to neighboring plants. Visit Michigan Dept. of Natural Resources for more details.

DISPOSAL OF REMOVED PLANTS: Plant material with fruit present should be burned or bagged and disposed of in municipal waste. Plant parts without fruit should be placed in the sun to dry and may be put in a compost or mulch pile, provided that care is taken to ensure that all removed plant parts are dead and no fruit is present.

Distribution:

Asiatic bittersweet is found mostly in the northeast regions of the U.S., including all the New England states. Outbreaks are found as far west as Minnesota and in some southern states.

EDDMapS. 2024. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed June 7, 2024.

Other Facts and Background:

Asiatic bittersweet is native to Eastern Asia, including Japan, China, and Korea. It was originally introduced to the U.S. as an ornamental and for erosion control. In CT, its movement as well as its sale is prohibited. **Do not buy or make wreaths of the fruit of these vines.**

SOURCES: Connecticut Invasive Plants Council. (2018, October). *Connecticut Invasive Plant List.* https://cipwg.uconn.edu/wp-content/uploads/sites/244/2023/04/CT-Invasive-Plant-List-2018_Scientific-Name.pdf.

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Japanese knotweed *(Fallopia japonica,* syn. *Polygonum cuspidatum)*

By Victoria Wallace, Alyssa Siegel-Miles, and Klaudia Sowizral, UConn Extension

Identifying Features:

- **OVERVIEW:** Perennial, herbaceous. Shrubby in appearance (Figure 1). Height 6-15 ft, with a deep taproot. **Allelopathic** (releases chemicals that can inhibit the growth of neighboring plant species).
- **LEAVES:** Simple, alternate; 4-6 in long, 3-5 in wide. **Broadly ovate** (broad and rounded or squared at the base); come abruptly to a point (Figure 2). **Emerges in early spring**, initially appearing visually similar to rhubarb or bamboo, then **unfurls with distinctly triangular**, bright red-purple leaves that turn green over time.
- **STEMS:** Smooth, **noticeably jointed and with reddish-purple mottling at nodes** (Figure 3)**. Ocrea** (thin sheath) present at nodes, where the stem is swollen. **Hollow between nodes**. Covered in a fine whitish coating that easily rubs off.
- **FLOWERS:** Small white/cream colored flowers occur in **lacey, 3-4 in long clusters** at the upper leaf axils along the length of the stem in late August-Sept. (Figure 4).
- **SEED/FRUIT:** Dark brown, glossy, tiny seeds are enclosed in 8-9 mm long, three-winged achemes (papery fruits). Can be dispersed by wind, water, transported soil, birds, or insects. Dioecious.
- **ROOTS:** Deep taproot and extensive rhizomes (underground stems). Up to two-thirds of the plant's biomass exists underground (fs.fed.us).
- **REPRODUCTION/SPREAD:** Primarily vegetative by rhizomes, and, to a lesser extent, by seed. Extensive network of rhizomes quickly crowds out surrounding vegetation. Easily regenerates/forms clonal shoots from small pieces of rhizome or root tissue.


Figure 1.


Figure 2.


Figure 3.


Figure 4.


Figure 5.

From top: 1) An infestation of Japanese knotweed along a roadside. 2) Close up of foliage. 3) Juvenile stems. 4) Close up of flowers. 5) Arrows indicate the ideal location to cut stems multiple times during the growing season for mechanical control. Photo by Petie Reed, Source: Kathy Connolly. Photos by Alyssa Siegel-Miles except where noted.

Habitat:

Japanese knotweed thrives in disturbed areas, along roadsides, and on stream or river banks, forming dense thickets that pose a significant ecological threat to riparian areas. Its ability to rapidly colonize an area threatens native vegetation and can greatly alter natural ecosystems. It can grow well in full sun, deep shade, soils of high salinity, and extreme drought. It can also survive severe floods. Its extensive root system has been known to penetrate asphalt and cracks in concrete.

Control:

Prevention is key: early detection and rapid response are the most effective means of Japanese knotweed management.

MECHANICAL CONTROL:

- **Cut plants with pruners or loppers three times per year**, in May or early June, mid-July, and late August before flowers appear. **The third cut should be completed before fall** (by August 31 is recommended) to prevent the movement of the plants' energy from its leaves to its rhizomes. **Each stem should be cut below the lowest node** (refer to Figure 5, page 1). **Repeat this process for a minimum of three years.**
- Place all removed plant material in heavy duty contractor bags and dispose of in regular trash. **Do not place any cut plant material in a compost pile or leave on site. Rhizome fragments left on the ground can easily resprout.**
- **Follow-up maintenance for multiple years is critical to eradication success and to eliminate sprouting from all rhizomes,** which may produce new shoots for three years. Refer to Nip the Knotweed for more details.
- **Digging and hand-pulling of established plants are NOT recommended** as new shoots can easily form on root and rhizome fragments. (Hand-pulling is recommended for very young plants only.)
- Stem cutting efforts can be combined with shading (black or clear plastic) or a chemical application.

CHEMICAL CONTROL: *Follow label instructions for any chemical application.*

- Herbicides (e.g., glyphosate with a surfactant or triclopyr) **can be applied on leaf surfaces with sprayers, painted on cut stems, or administered via stem injection.**
- **Applications are recommended in late summer before flowering or just after flowering up until the first killing frost** (September-November). **Do not spray when plants are flowering**; many pollinators feed on the flowers.
- **Recommended protocol**: Cut or mow the plant to 2-3 in during mid-late spring (May-June) to prepare for a planned foliar treatment in late summer or fall. Cutting the plant in spring reduces plant height at the time of spraying, enabling better control of the spray, decreases the amount of product needed, and delays flowering so that plants can be sprayed in August without risk of harm to pollinators.
- **Follow-up treatments, the following year, are essential** to managing populations of Japanese knotweed, and should be timed after July 1st, similar to the initial treatment. Following year two, chemical treatments may be repeated every two years.
- Refer to New Hampshire Department of Agriculture or Michigan Extension for more details.

After cutting or chemical control (year two), replant with native species to minimize knotweed re-establishment.

Distribution:

Japanese knotweed is found throughout much of the U.S., especially in the Northwest, the Northeast, and the Northern Midwest.

EDDMapS. 2024. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed June 7, 2024.

Other Facts and Background:

Japanese Knotweed is native to Eastern Asia, including China, Japan and Korea. It was introduced to the U.S. as an ornamental in the late 1800s and was initially used for erosion control. Its population spread rapidly and was noted as a problematic species by 1930. The plant is reported to have medicinal applications.

SOURCES: Connecticut Invasive Plant Working Group. (n.d.). *Japanese Honeysuckle (Lonicera japonica).* https://cipwg.uconn.edu/japanese-honeysuckle/

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United States Department of Agriculture National Institute of Food and Agriculture

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Multiflora rose *(Rosa multiflora)*

By Victoria Wallace, Alyssa Siegel-Miles, and Klaudia Sowizral, UConn Extension


Figure 1.

Identifying Features:

- **OVERVIEW:** Multiflora rose is an invasive shrub that grows to 10-15 ft tall and 9-13 ft wide (Figure 1), forming impenetrable thickets.
- **LEAVES:** Compound, with 5-11 (usually 7-9) leaflets (Figure 2). Leaflets are dark green and smooth on the upper surface; paler with short hairs on the underside. The **base of each leaf stalk bears a pair of fringed stipules** (Figure 3), which distinguish multiflora rose from native rose species.
- **STEMS:** Juvenile stems are green with red thorns, which mature to brown (Figure 4). Arching branch habit allows tips of stems to bend to the soil surface, where they can take root and form new (clonal) plants.
- **FLOWERS: White to pinkish five-petaled flowers, which open in May and June**; 0.5 to 1.5 in. in diameter (Figure 5). **Occur in branched clusters**.
- **SEEDS:** Tan to yellow; up to .16 in. **Seed germination rates are high** - up to 90% in the absence of drought and stress. Seed remains **viable for up to 20 years**.
- **FRUITS:** Bright red, smooth hips (Figure 6). Fruits form in clusters after flower blooms during the summer and persist on plant through the winter.
- **REPRODUCTION/SPREAD:** Plants can produce up to 500,000 seeds per year, which are eaten and spread by birds. Can also reproduce vegetatively from the canes (layering) and root sprouts.


Figure 2.


Figure 3.


Figure 4.


Figure 5.


Figure 6.

From top: 1) mature plant; 2) young compound leaves; 3) stipules; 4) juvenile vs. mature stems (photo by James H. Miller, USDA Forest Service, Bugwood.org); 5) flowers (photo source: Penn State Extension; 6) mature fruit. Photos by Alyssa Siegel-Miles except where noted.

Habitat:

Multiflora rose thrives in full sun and well-drained, infertile soils. It is known to proliferate in pastures, field edges, and along roadsides. Multiflora rose can also persist in part shade, although flower and fruit production is less abundant.

Control:

A combination of control tactics is necessary to manage this plant. The optimal time for eradication success is right before the plant flowers. **A long-term management plan, including continued follow-up maintenance, is critical to prevent reinfestation or new establishment by seed.**

MECHANICAL CONTROL:

- Pulling, digging, cutting, and mowing may be viable components of a control strategy. **Seedlings may be hand pulled**. Small plants may be removed by digging, **ensuring that the entire root crown is extracted to prevent regrowth**. Cut back top growth of established plants to enable easier removal of the root crown (e.g., with a brush mower). Utilize tools (e.g., Weed Wrench, Extractigator) to facilitate the removal of larger specimens.
- Cutting should be done monthly, beginning early in the season. Repeated mowing, with **six or more cuts per year near the ground for two to four years**, will weaken the plant, inhibit flower and fruit production, and may eventually kill small infestations. Cutting is usually performed in combination with another form of control (e.g., chemical) for greater efficacy.

CHEMICAL CONTROL: ***Follow label instructions for any chemical application.***

Cutting or mowing large infestations before any herbicide applications is recommended: it will stress the plants, which will increase herbicide effectiveness.

- **Cut stump:** Immediately after cutting, apply a systemic herbicide (e.g., glyphosate or triclopyr) to freshly cut stems or stumps with a paint brush or sponge applicator. Treatment can be applied anytime during the year when the plant is actively growing; greatest effectiveness will occur in July to mid-September. For best results, cut plants to 6-12 in. in March-June and allow them to resprout. Cut them again to 1 in. and apply herbicide to the cut stumps in July to mid-September.
- **Foliar:** A systemic herbicide can be applied directly to foliage from July to September. After initial mowing, allow the plant to regrow; apply foliar treatment once regrowth has reached 2-3 ft.
- Refer to Penn State Extension for more details.

Distribution:

Multiflora rose is widespread in the northeast United States, the Midwest, and southeastern states, with scattered infestations in California and Oregon.

EDDMapS. 2024. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at www.eddmaps.org/; last accessed June 7, 2024.

Other Facts and Background:

Multiflora rose is native to China, Japan, and Korea. The plant was introduced to the United States in the 1860s for its ornamental value, was routinely used as root stock for rose breeding programs, and was promoted by the USDA Soil Conservation Service for erosion control. It was frequently used as a 'living fence' and touted as a food and cover source for wildlife. By the 1960s, the invasive properties of the plant were well established and the overall effect of the plant on habitat value was determined to be negative.

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United States Department of Agriculture National Institute of Food and Agriculture

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CONNECTICUT INVASIVE PLANT WORKING GROUP

INVASIVE PLANT FACTSHEET

Japanese honeysuckle *(Lonicera japonica)*

By Victoria Wallace, Alyssa Siegel-Miles, and Klaudia Sowizral, UConn Extension

Identifying Features:

- **OVERVIEW:** Japanese honeysuckle is an aggressive invasive woody vine that climbs, suffocates, and strangles other plants (*Figure 1*). Vines can grow 80-120 ft. Deciduous in colder climates; evergreen in moderate to warmer areas.
- **LEAVES: Opposite**, ovate, 1.5-3 in long (*Figure 2*). Slightly glossy on upper sides of leaf, slightly hairy on underside. Margins are untoothed. Juvenile leaves may be lobed. **Paired leaves are not fused at the stem.**
- **STEMS:** Juvenile stems are reddish. Stems and petioles are variably pubescent (fuzzy). Older stems are hollow and brown, with bark that peels in strips. Stems can grow up to 2 in thick.
- **FLOWERS: Tubular and bi-lobed** (4 of the 5 petals are joined for most of their length above the flower tube). Occur in June-July. **Flowers are fragrant, white, fading to yellow** (*Figure 3*), and **paired at the leaf axis** (where leaf stem attaches to vine). Each pair of leaves has 2 flower stems, with 2 flowers each.
- **SEEDS:** Germinate after soil disturbance.
- **FRUITS: Berries are dark purple to black** (*Figure 4*). Fruiting occurs in September through November; fruits can persist through the winter. Each fruit is 2-3 mm wide and contains 2-3 seeds.
- **REPRODUCTION/SPREAD:** By seed, which are eaten and dispersed by birds and small mammals. Vines also reproduce vegetatively via underground shoots (rhizomes), sprouts from the root crown, and aboveground runners that root at the nodes and can grow more than 10 ft/year.

From top: 1) Japanese honeysuckle infestation smothering a tree; 2) foliage; 3) mature flowers; 4) leaves and fruit. Photos by Alyssa Siegel-Miles.

Native Alternatives and Look-Alikes:

Coral honeysuckle (*Lonicera sempervirens*) is an excellent native alternative. Japanese honeysuckle has many look-alikes, which makes proper identification crucial. Common vining plants in the *Lonicera* genus, which can be mistaken for Japanese honeysuckle, include grape honeysuckle (*L. reticulata*), yellow honeysuckle (*L. flava*), hairy honeysuckle (*L. hirsuta*) and red honeysuckle (*L. dioica*). **The common look-alikes feature clusters of many flowers, paired leaves fused at the stem, and bright red and orange fruit. Japanese honeysuckle can be differentiated by its dark colored fruits and the absence of any pairs of fused leaves**.

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Japanese Honeysuckle

(Lonicera japonica)

Control:

MECHANICAL CONTROL:

- **Seedlings and small infestations may be hand-pulled.** **The entire root system must be removed** to prevent regrowth. Pulling and digging are preferable prior to fruit production. Digging is most effective when the soil is moist. **Frequent monitoring and repeated removal** are necessary to prevent reestablishment. Note that pulling or digging plants causes soil disturbance, which can stimulate germination of the seed bank.
- **Periodic mowing** (at least twice a year, in mid-July and mid-September) may slow the plant's spread. **Vines can be cut** to prevent climbing, girdling, and killing of any plants in which they are established. Avoid pulling cut vines if entangled in fine twigs. Note that cut plants will resprout; cutting or mowing may increase plant density if not supplemented with another form of control.
- For effective control, **mechanical treatments should be supplemented with chemical control**. Follow up treatments may be required for several years.

CHEMICAL CONTROL: *Follow label instructions for any chemical application.*

- **A foliar spray** of glyphosate or triclopyr can be applied from spring through fall. **Repeat applications are often required**. Treatment in the fall, after the first frost, when many non-target plants are dormant, is recommended.
- **Cut stem treatment**: A 25% glyphosate or triclopyr solution can be applied to cut stem surfaces any time of year as long as the ground is not frozen.
- Where foliage is evergreen in moderate and warm climates, **there may be opportunity to apply herbicides in late fall or winter**, when many native species are dormant. For effective herbicide control, healthy green leaves must be present at application time and temperatures must be sufficient for plant activity. Refer to Plant Conservation Alliance's Alien Plant Working Group for more details.

Distribution and Background:

Japanese honeysuckle is widespread in the Eastern United States from Maine to Florida, as well as the Midwest, Southeast U.S., California, and Nevada. It was first introduced to the U.S. in Long Island, New York, in 1806, for its perceived ornamental, erosion control, and wildlife value.

EDDMapS. 2020. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org.

Habitat:

Japanese honeysuckle grows in a variety of soil conditions. It thrives in full sun and is also shade tolerant. It proliferates in disturbed areas, including fields, forests openings, and woodland edges. The fast-growing vine climbs surrounding trees and other vegetation, killing plants by girdling, smothering, or causing them to collapse under their weight. Japanese honeysuckle is sensitive to dry conditions and low temperatures, which may limit northern and westward spread.

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USDA NIFA
United States Department of Agriculture
National Institute of Food and Agriculture

SOURCES: cipwg.uconn.edu; nrcs.usda.gov; plants.ifas.ufl.edu; invasive.org; extension.psu.edu

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INVASIVE PLANT FACTSHEET

Common mugwort *(Artemisia vulgaris)*

By Victoria Wallace, Alyssa Siegel-Miles, and Klaudia Sowizral
UConn Extension


Figure 1. Roadside colonization in spring

Identifying Features:

- **OVERVIEW:** Perennial. Height 2-5 ft. tall. Aggressive establishment and colonization in roadsides, right-of-way areas, and disturbed and uncultivated areas (Figure 1). Laboratory studies have found the presence of chemicals that could potentially suppress the growth of nearby plants.
- **LEAVES:** Alternate, papery, with large pinnate lobes (Figure 2). **Green on upper surface (Figure 3), while undersides are covered with dense white to gray hairs.** Foliage is **aromatic**, with a chrysanthemum or sage-like odor. Leaves emerging from ground have shallower and broader lobes, whereas leaves on mid and upper portion of the plant have lobes that are more linear and deeper.
- **STEMS:** Purplish-brown, branched, and covered with short hairs.
- **FLOWERS:** Inconspicuous flowers that lack petals. Occur in small terminal clusters (at the tops of stems). Yellowish, 2.5-3 mm long; composed of many disk flowers clustered onto a flat head (Figure 4).
- **FRUIT:** Single seed enclosed in a brown achene. Oblong with a narrow base, with small bristles at the tip.
- **REPRODUCTION/SPREAD:** Spread primarily by **aggressive rhizomes** (horizontal underground stems) (Figure 5), which form large, fast-spreading patches. Can also reproduce by seed. Some seeds will sprout when bare, disturbed ground is available to form new colonies.


Figure 2. Growth habit


Figure 3. Foliage


Figure 4. Flowers

Habitat:

Mugwort does well in partial to full sun and moderately dry to mid-moisture soils. It does not persist in wet soils, as it is susceptible to root rot. The plant is frequently found in high elevation areas, disturbed habitats, meadows, valleys, and roadsides.


Figure 5. Roots and rhizomes.

Figures 1-3 and 5-6 by Alyssa Siegel-Miles; Figure 4 by Radio Tonreg, North Carolina Extension.

Control:


Figure 6.

MECHANICAL CONTROL:

- To prevent seed dispersal, **mow from early summer to mid-September**, before seedhead production or before seed has matured. The first two weeks of September are the best time to mow. Cut immature seeds will not mature into viable seed. Mowing after seed has matured, from mid-fall through winter, is not recommended, as it would disperse mature, viable seed. If mowing after the second week in September, collect and bag mugwort cuttings, if possible.
- When possible, **hand pulling very young plants** in spring or early summer, before formation of rhizomes, may keep spread of populations in check and prevent establishment of new colonies. Scouting and prompt removal is essential.
- A heavy-duty landscape fabric or other impenetrable mulch can be used to smother mugwort. May require combination with other control methods to be successful.
- Since mugwort seeds sprout wherever there is exposed bare ground, **stabilization and re-seeding of bare soil on roadsides** with a grass cover will reduce establishment of mugwort populations.

CHEMICAL CONTROL: Follow label direction when using all chemical treatments.

- **Timing of any chemical control is critical. Follow label instructions.** The dense hairs on the mugwort leaf (Figure 6) make herbicide penetration difficult. A surfactant may be needed.
- **Foliar spray** of glyphosate applied in late summer or early fall will suppress mugwort the following year, but not necessarily eradicate it. More selective herbicides, such as triclopyr and clopyralid, effectively control mugwort.
- Consulting with or hiring a licensed pesticide applicator is recommended.

Refer to CIPWG's Invasive Plant Management Calendar

Distribution:

Common mugwort is found throughout much of the northeast, extending west to Minnesota and south to scattered areas in Florida. Many counties in Oregon and Washington have also reported large populations.

EDDMapS. 2024. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed June 7, 2024.

Other Facts and Background:

Common mugwort is native to Europe and Eastern Asia. Mugwort was brought into North America as early as the 1600's for medicinal purposes. It spread throughout the Northeastern U.S. as a contaminant on ships and nurseries. Mugwort pollen is a common cause of allergies and hay fever, wherever abundant. The plant is a common ingredient in many products, including insect repellents.

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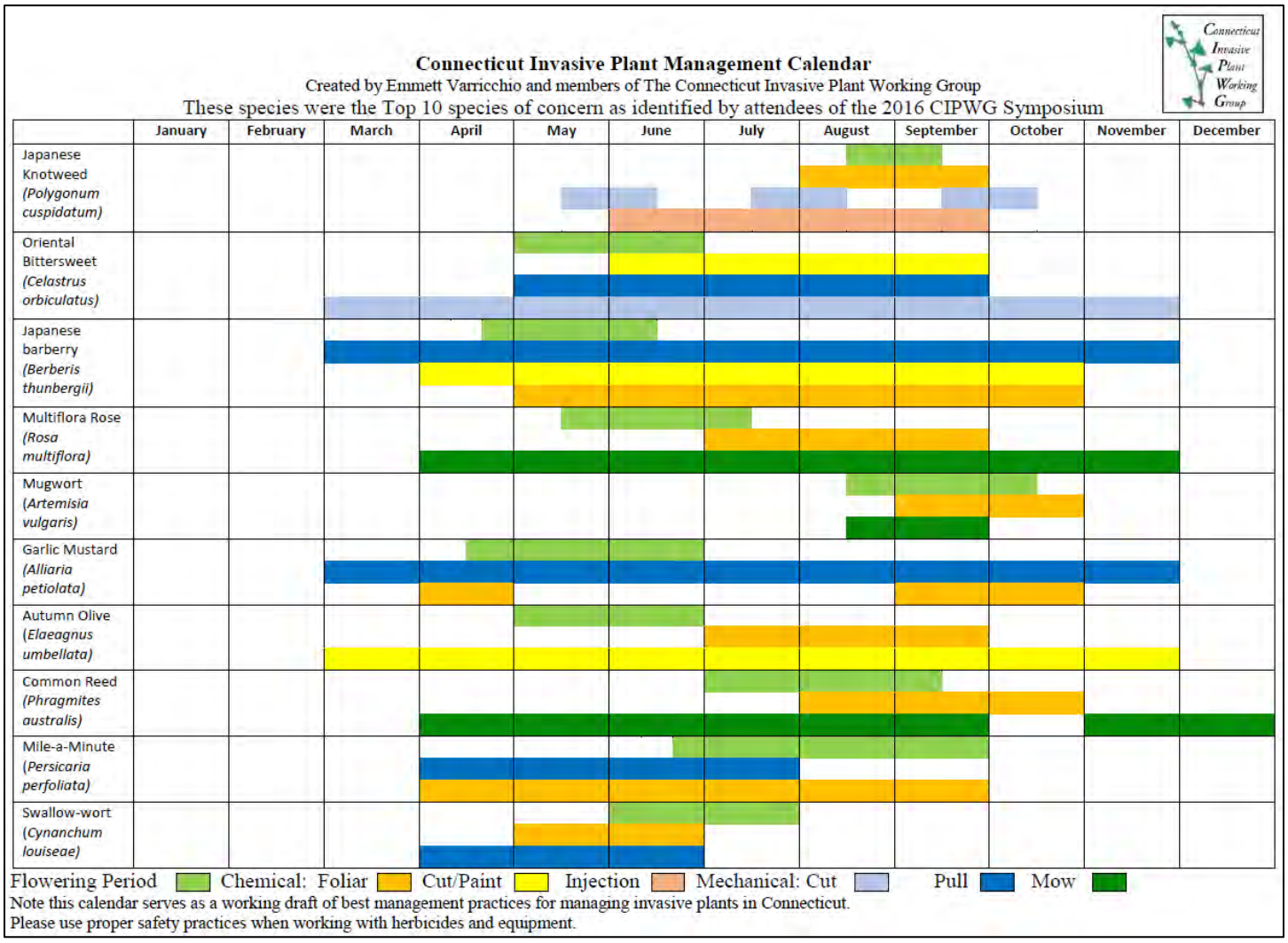
APPENDIX H – Connecticut's Invasive Plant Management Calendar



This was an abridge presentation, the full presentation can be found here:

https://cipwg.uconn.edu/wp-content/uploads/sites/244/2018/10/Invasive-Plant-Management-Calendar.pdf

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