MANAGEMENT GUIDELINES

This section of the plan will help the Town of Greenwich care for the Bruce, Byram, and Binney Parks and Montgomery Pinetum landscapes. It includes strategies for the care of plants (trees, shrubs and turf), structures (steps and buildings), and pavement. By following these strategies, Town employees will help ensure the long term health and beauty of some of Greenwich's most prominent historic landscapes.

Management Log

Before the Town begins management of the parks' landscapes, staff should set up a "management log," or ongoing written record of inspections, repairs, and introductions of new features listed by date. The log should include methods and materials employed, as well as names and contact information for any specialists employed in each park's care. The log should be stored, in both electronic and manual format, in a secure location within the Division of Parks and Trees.

EXISTING PLANTS

Trees

As noted in several places in this report, trees greatly impact each park's appearance, with mature trees and tree stands playing dominant roles. To maintain the trees' health the Town should adhere to the measures that follow. For treatment of individual trees, the Town should consult a Connecticut Certified Arborist.

General Tree Management Guidelines

1. Test the park soil for quality in relationship to the mature tree population. The test will detect any soil deficiencies, and determine a remedy for correcting them.

2. Provide and install cables. These will help stabilize any weakly-joined tree limbs.

3. Treat trees with a systemic insecticide to minimize stress caused by leaf-feeding pests.

4. Prune trees, removing all dead wood greater than ½" in diameter.

5. Create rings of mulch around the base of each tree, as wide as possible and up to the diameter of the tree crown.

6. Where soil has built up at the base of trees, remove enough to expose the root collar.

7. Remove any dead trees.

Turf

The following fertilizing and mowing guidelines will help maintain the turf areas, promoting a lush, green appearance and healthier, longer living plants.

1. Fertilize sparingly, as too much fertilizer can cause grass to grow too rapidly, requiring more mowing and making the plants more susceptible to disease. Not enough fertilizer can result in weaker plants that are more susceptible to disease or stress brought on by drought.

2. Apply fertilizer three times per year – around Memorial Day and Labor Day, and finally, around Halloween.

3. Do NOT fertilize in mid-summer. At this time of year, roots have become dormant. Fertilizer will cause the leaves to grow, making the plants less tolerant of drought, heat and disease.

4. Follow these fertilizing instructions:
   - *Memorial Day* – apply 1 pound of Nitrogen per 1,000 sf (with 50% of Nitrogen slow-release). Use an N:P:K Ratio of 14-14-14.
   - *Labor Day* - apply 2 pounds of Nitrogen per 1,000 sf (with 50% of Nitrogen slow-release). Use an N:P:K Ratio of 14-14-14.
   - *Halloween* - apply 1 pound of Nitrogen per 1,000 sf (with 75% of Nitrogen slow-release). Use an N:P:K Ratio of 28-3-9.

5. When mowing, remove no more than one-third of the height of the turf at one time, always leaving twice as much leaf height as is cut.

6. The best level for mown grass is 2 ½ inches, with 2 to 3 ½ inches the range.

7. It is best to mow lawns on an as-needed basis, not on a regular schedule, such as once per week.

8. When mowing around historic features, such as stone walls and bridges, the Town should avoid contact between the equipment and stones. Weed-whackers should be used sparingly, and preferably not at all.

Exotic Invasive Plants

Invasive plants are non-native species that were introduced to the United States by horticulturists as ornamental or exotic plants. They quickly adapted to the growing conditions of U.S. climates, and spread, overtaking and crowding out native species. Invasive plants are difficult to control and must be monitored closely to prevent them from eliminating other more desirable plant species. The four historic parks contain several invasive species, including

Norway maple (Acer platanoides), tree of heaven (Ailanthus altissima), Asian bittersweet (Celastrus orbiculatus), Purple Loosestrife (*Lythrum salicaria)*, and Japanese Knotweed (*Polyganum cuspidata*). The following are general measures for controlling these species.

Norway Maple (Acer platanoides)
Norway maple is native to Europe and Western Asia, and was introduced in the United States as an ornamental landscape plant. It reproduces prolifically in forests, fields, and other natural habitats, forming dense, shady stands and displacing native trees and shrubs. The tree has smooth, grey bark that becomes furrowed with age, and its leaves are dark green. The leaves have little or no fall color, which is one of the easiest ways of distinguishing it from the brilliant orange-colored sugar maple.

Norway maples spread by sending their mature fruits, or "samaras" through the wind. Small seedlings may be uprooted from the ground by hand, and small and large trees can be cut to the ground level. An application of glyphosate (Roundup) or triclopyr (Garlon 3A or Garlon 4) herbicide can also help control. The best means of control, however, is simply not planting them.

Tree of Heaven (Ailanthus altissima)
The tree of heaven is a rapidly growing deciduous tree native to Central China. A Philadelphia gardener mistakenly introduced the tree of heaven to the U.S. in 1784, believing its seeds to be those of the lacquer tree. During the California gold rush, Chinese miners brought seeds with them for uses in traditional medicines. The tree has smooth stems with pale gray bark and light chestnut brown-colored twigs. The leaves range from one to four feet in length and are compound, containing 11-25 smaller leaflets. The tree produces clusters of small, yellowish green flowers in the spring and twisted seed pods ("samaras") in the late summer and early fall. Each tree can produce as many as 325,000 seeds per year, and the seeds are easily dispersed by the wind.

The tree of heaven grows very rapidly and can take over an entire site, forming an impenetrable thicket and crowding out other less aggressive species. Its roots can also damage sewers and foundations. The most effective way to control tree of heaven is to pull seedlings by hand before the tap root develops. Systemic herbicides, including glyphosate (Roundup) and

triclopyr (Garlon 3A or Garlon 4) may also be used when the trees are in full leaf.* The chemicals should be applied to leaves and green stems, basal bark and/or cut stumps. Finally, research suggests that fungal pathogens may control the plants.

Asian Bittersweet (Celastrus orbiculatus)
Asian Bittersweet is a deciduous, woody, perennial vine native to Eastern Asia. It was introduced in the U.S. as an ornamental plant and is still widely planted and maintained as an ornamental vine. Its leaves are rounded and glossy and it produces clusters of small greenish flowers. Mature plants produce green to yellow fruits which split open to show red-orange seed sacs ("arils"). Many people cut the vines containing the fruits to make floral arrangements and wreaths. While attractive, the cuttings promote further spread of the vines.

Bittersweet invades the groundcover, shrub, understory and canopy layers of both wooded and open areas. In addition to blocking light and starving other plants, it girdles and chokes the trunks of trees. Two methods of control are possible for the plant. In areas of small investation, the vines may be uprooted before fruiting. Herbicides such as glyphosate (Roundup) or triclopyr (Garlon) may be applied after the vines have been hand-cut or mown.[1]

Purple Loosestrife (Lythrum salicaria)
Purple Loosestrife is an erect, perennial herb, introduce in the United State in the 1800s for medicinal and ornamental purposes. Its stem is square and its lance-shaped, stalkless leaves are opposite or whorled. It produces deep magenta-colored flower spikes through much of the summer. It infiltrates both fresh water wetlands as well as tidal and non-tidal marshes.

Control of Purple Loosestrife may be implemented by hand pulling small plants before seeds set, or treating with glyphosate (Rodeo for weltands). Herbicides should be applied late in the season when plants are preparing for dormancy. Biological control, using inspect species approved by the US Department of Agriculture – the root-mining weevil, leaf-feeding beetles, and flower-feeding beetles. For more information about use of biological control measures, contact the Connecticut Department of Agriculture.

[1] The Town should use pesticides wisely by reading the entire pesticide label carefully, following all mixing and application instructions and wearing all recommended personal protective gear and clothing. The Connecticut Department of Agriculture should also be contacted prior to any chemical applications, as the agency may dictate pesticide use requirements, restrictions or regulations.

Japanese Knotweed (Polyganum cuspidata)
Native to eastern Asia, Japanese Knotweed grows along the stream bank in the Reading Room (between Binney Park and the Helen Binney Kitchel Natural Area. The plant arrived in North America late in the 19th century and was used for ornamental purposes. It spreads aggressively by seed and rhizome – runners that can extend up to fifteen to eighteen feet underground. To date, no definitive means of control exists, except for complete removal of the plants and their rhizome network.

The key to managing Japanese Knotweed is persistent and continual treatment. If the Town finds that the plant colony and its rhizome network are too large to remove, staff should control it through *cutting* and *application of an herbicide*. Staff should *cut* the stalks at least three times per season, before the plants mature and produce flowers. Staff should also apply an *herbicide*, such as glyphosate, immediately after the stalks have been cut, and preferably in the fall, when the plant is fueling growth of the rhizomes.

NEW PLANTS
Historical research conducted for each of the parks revealed some of the historic plant species originally installed in each. When introducing new trees and shrubs, the Town should consult this research and draw from it as much is possible.

New Trees & Shrubs
Specifications for planting new trees and shrubs should be included in all relevant landscape preservation projects, conducted in the future at the parks. All planting should adhere to these specifications unless otherwise approved by the landscape architect. In summary, newly planted trees are unlikely to survive if they do not receive special care and attention, particularly in the first few years after planting. In general, adhere to the following care guidelines:

- Plant in the spring or fall, and never during the heat of summer.

- Hire a landscape contracting company to plant trees and shrubs. Trees and shrubs that are planted correctly will be far more likely to survive and thrive. The contractor should guarantee all trees and shrubs for one year after planting. However, *the guarantee is valid only if the plants have been properly cared for.*

- If staking new trees is necessary, be sure to remove stakes and guy-wires within one year of planting. If the trees appear to need some kind of individual protection because of

their location, build a simple fence rather than leaving the guy-wires on. Wires can damage and will eventually kill the tree if left in place too long.

- Provide the trees and shrubs with at least one inch of water each week. This water can be supplied by rainfall or by supplemental watering. Spreading one inch of water using a hose attached to an exterior water spigot takes approximately two-three hours. Water must soak deep into the soil to encourage good root growth and overall plant health. Adjust the flow of water so it has time to sink into the ground, reducing the pressure if small "rivers" develop. The water should sink into the ground around the tree or shrub, rather than flowing away.

- If drought dominates the fall, be sure to water trees and shrubs well before the ground freezes, protecting the plants from entering winter in dry soil.

- Mulch plants to help control weeds and keep moisture in the soil (and maintain a neat appearance in the landscape). Use composted pine bark mulch that has been aged a minimum of three months. Apply the mulch to a depth no greater than three inches. Each spring, fluff the existing mulch and add more, as needed. Keep mulch away from the stems or trunks of trees and shrubs, and off shrub branches (to minimize decay and prevent insect infestations).

- Prune trees and shrubs to enhance their natural form and appearance, and to help maintain their health. Enlist the expertise of a professional or person trained in proper pruning practices. Prune only by hand (never use electric pruners). Prune broken branches immediately to prevent disease.

New Turf Areas

When patching turf outside of athletic field areas, the Town should adhere to the following measures to help insure long-lived, healthy lawn areas:

1. A seed mixture, consisting of Kentucky bluegrasses, fine fescues and perennial ryes is best, as it minimizes the amount of mowing (each grows at a different rate) and provides a consistent green appearance. Using a mix will avoid the problems arising from monocultural plantings. A local seed market will offer mixes appropriate for the Greenwich area.

2. Once applied, seed should be covered with straw mulch. Hay should be avoided as it encourages weed growth.

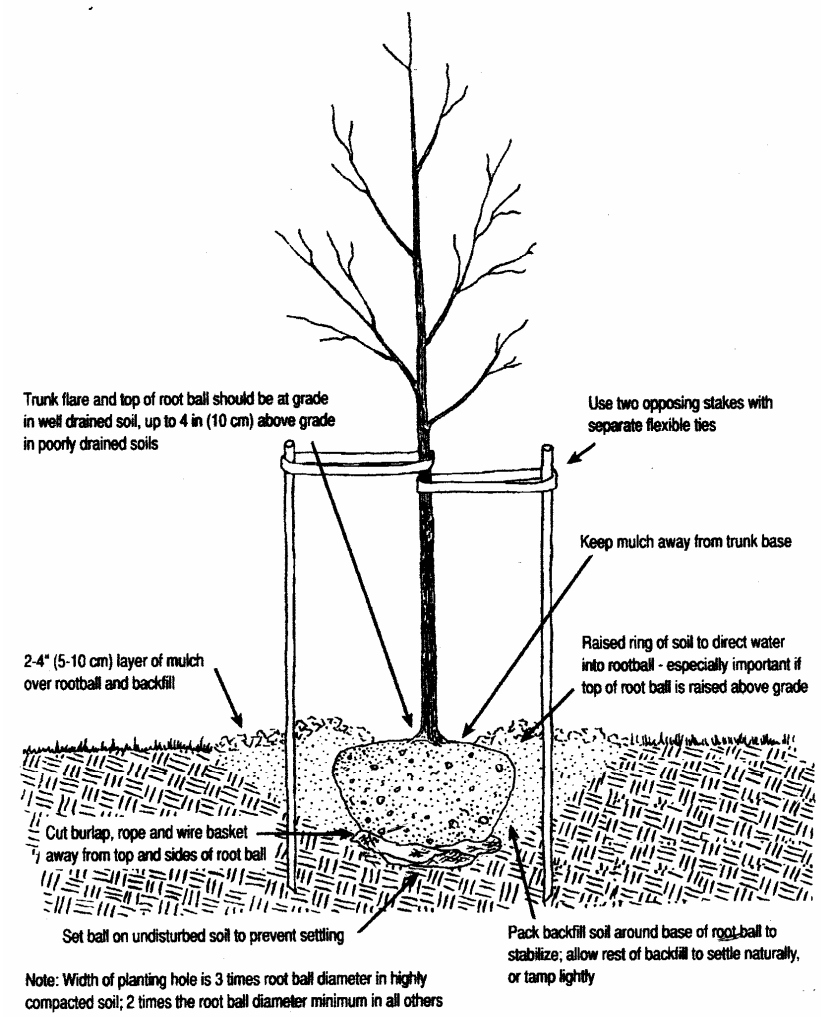
3. The seeded area should be watered as frequently as possible to encourage germination (approximately once inch of rainwater per week).

4. Do not use herbicides to control weeds when the turf is becoming established.

5. Once the turf is established, remove the straw mulch and follow the instructions listed above for ongoing management.

Planting Methods

When introducing new trees to each of the existing communities, the Town should adhere to industry standards for planting. At a minimum, the Town should follow the recommendations included following planting detail.



Tree Planting Detail. Source: University of Connecticut Cooperative Extension Service.

ROADWAYS & PATHS

The Town should inspect the paved roadways and paths yearly, looking for damage from frost heaves or vehicle tires. If the routes require patching, the should be followed to maintain an even, unblemished appearance.

STRUCTURES

The Town should inspect the park's structures (steps, walls, bridges and buildings) yearly, looking for dislodged stones, cracked mortar, dirt and graffiti. Major repairs should be made by qualified professionals only.

Yearly Cleaning
To prevent build up of dirt and grime on the granite and puddingstone steps, the Town should wash the surface yearly with a low-pressure application of water (less than 250 psi).

Graffiti Removal
Graffiti should be removed with solutions approved by the *National Park Service Preservation Brief 38, Removing Graffiti from Historic Masonry.* In particular, the Town should adhere to the following guidelines:

- Identify the material used to make the graffiti. Most often, vandals employ spray paint (polyurethane, lacquer, enamel), brush-applied paints (oil and synthetic resins including vinyl, acrylic, acetate, methacrylate, or alkyd), permanent and water-soluble felt markers, ballpoint pens, chalk, graphic and colored pencils, pastels, wax and oil crayons, liquid shoe polish, and lipstick.
- Identify the substrate material of the object containing the graffiti. Masonries are porous materials, making them sensitive to abrasion.
- Consult a historic masonry specialist before attempting to remove the graffiti. Specialists should maintain membership in the American Institute for Conservation (AIC), and perform all work in accordance with the AIC Code of Ethics and Standards of Practice. These individuals will assess the porosity of the substrate material and propose the best removal method. Methods include employing poultice (an absorbent material mixed with a cleaning solution and applied in the form of a paste), water and detergent, organic solvents, alkaline compounds, bleaches, mechanical treatment, and laser cleaning. The method should be tested on a small, obscure area of the graffiti-ed object prior to proceeding with removal.*
- Where appropriate, apply an anti-graffiti coating to the vandalized object. Such coatings can help facilitate easier removal of graffiti, but they do not prevent graffiti from occurring. Some are permanent, and others must be re-applied once the graffiti has been removed. Because the coatings can seal the object, they can lead to water build- up and eventual water-related deterioration.

In addition, the Town can take the following measures to minimize the occurrence of graffiti:

- Remove graffiti immediately after it occurs. Studies have shown that graffiti that remains on objects attracts more graffiti, complicating the problem. Graffitists gravitate and return to sites where their work will remain for longer periods of time.
- Perform regular maintenance throughout the park, including tree care, brush and understory removal, mowing and road maintenance. Well-maintained landscapes draw far fewer vandals than do poorly maintained ones.
- Install improved lighting and motion sensitive lighting in areas where graffiti has occurred in the past.
- Implement programs and activities that draw people in large numbers to the park at all times of year. Vandals are less likely to attack landscapes that are being watched.

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