

Land Management Plan

A Narrative for Invasive Plant Management
and Native Plant Restoration

66 Burditt Ave
Hingham, MA

Summer 2020



PARTERRE
ECOLOGICAL

Table of Contents

| | |
|---|--------------|
| Introduction & Primary Goals | 1 |
| Invasive Plant Inventory and Plan | 2-5 |
| Invasive Plant Management Techniques | 5-8 |
| <i>Descriptions of proposed Manual Removal and Herbicide Application Management Methods</i> | |
| Bittersweet and Vines | 7 |
| Habitat Interventions | 8 |
| Management Calendar | 9 |
| Native Plant Inventory and Restoration | 10-12 |
| Inventory | 10 |
| Restoration strategies and species | 11-13 |
| Tree Removal and Replacement | 14 |
| Restoration planting plan | 15 |
| Live Stake Detail | 16 |
| Management and Maintenance Schedule | 17 |
| Invasive Species Descriptions | 18-23 |
| Identification and Qualifications of Applicant | 24 |
| Precedent Restoration Project Images | 25 |



Introduction and Primary Goals

The Johnson residence is located at 66 Burditt Ave, Hingham within the 100' buffer zone of Broad Cove. The property has been surveyed and flagged by a professional wetland scientist. An inventory of existing native and invasive plant species can be found in this plan.

The primary goal of this plan is to seek approval from the Hingham Conservation Commission to restore native plant species within the 100' Buffer as mitigation for a proposed landscape renovation to the existing pool and landscape.

Additionally the wetland buffer has identified invasive plant species that we propose removing by manual hand methods and cut & dab herbicide application. The plan proposes removal of invasive understory species across the wetland buffer and restoration of native species (beyond wetland requirements) of native species to accessible areas dominated by invasive species.



A Fowlers Toad (*Anaxyrus fowleri*) clings ton the slope of the bank. The Land Management Plan proposes offsetting landscape enhancement construction by controlling/eliminating invasive species populations and restoring some areas with native plant species that will further support wildlife along the Cove.



66 Burditt Ave Invasive Plant Inventory

The deep shade caused by the Norway Maple canopy and the allelopathic chemicals released in the roots suppresses any native species on the steep portions of the slope. This has led to erosion along the bank. We propose controlling all invasive plant species that have developed self sustaining populations. The physiology of the invasive plants has enabled them to out compete the native plant community and compromise the ecological value of the native plant community and the Wetland areas. The dominant invasive plants can alter stormwater surface flow, moisture holding capacity in soils, and decrease wildlife habitat value. Any invasive shrubs in fruit will be removed from the site, but shrubs with no fruit can be cut and stacked into habitat piles(see pg.8)

Invasive Plant Species Identified:

Acer platanoides, Norway Maple
Acer pseudoplatanus, Sycamore Maple
Alliaria petiolata, Garlic Mustard
Berberis thunbergii, Japanese Barberry
Celastrus orbiculatus, Asiatic Bittersweet
Euonymus alatus, Burning Bush
Frangula alnus, Glossy Buckthorn
Lonicera morrowii, Morrow's Honeysuckle
Rosa multiflora, Multiflora Rose

**** Likely Invasive Plant Species Identified:***

Ampelopsis brevipedunculata, Porcelain Berry
Vitis spp., Grape

* While not listed as an Invasive Species by MIPAG (Massachusetts Invasive Plant Advisory Group) these species can dominate the shrub layer and crowd out native trees and shrubs. We recommend removal of non-native Crab apple along with listed invasive plant species in wetland buffers and replace with native shrubs and trees.



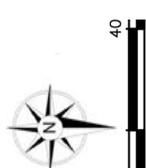
● Along the stairway are three large Norway Maples on the slope and a dense pocket of Morrow's Honeysuckle, Glossy Buckthorn, and Bittersweet. East of the stairway, dense shade restricts growth of vegetation and erosion is visible



Directly north of the home the north-facing slope down to Broad Cove is an overstory of Norway and Sycamore Maple with pockets of dense invasive understorey. Moving to the East, the canopy contains a diverse set of native trees with moderate patches of invasive shrubs and Norway Maple saplings.



- Intensive invasive species management (770 ft²)
- Shady Loose Slope with invasive perennials (2200ft²)
- Moderate invasive species management (3125 ft²)
- Most Native, some Buckhorn and Norway Maple Saplings (23900 ft²)
- Mowed walkway, few invasives
- Wetland Resource Border
- Property Line
- >6" Caliper Norway/Sycamore Maple



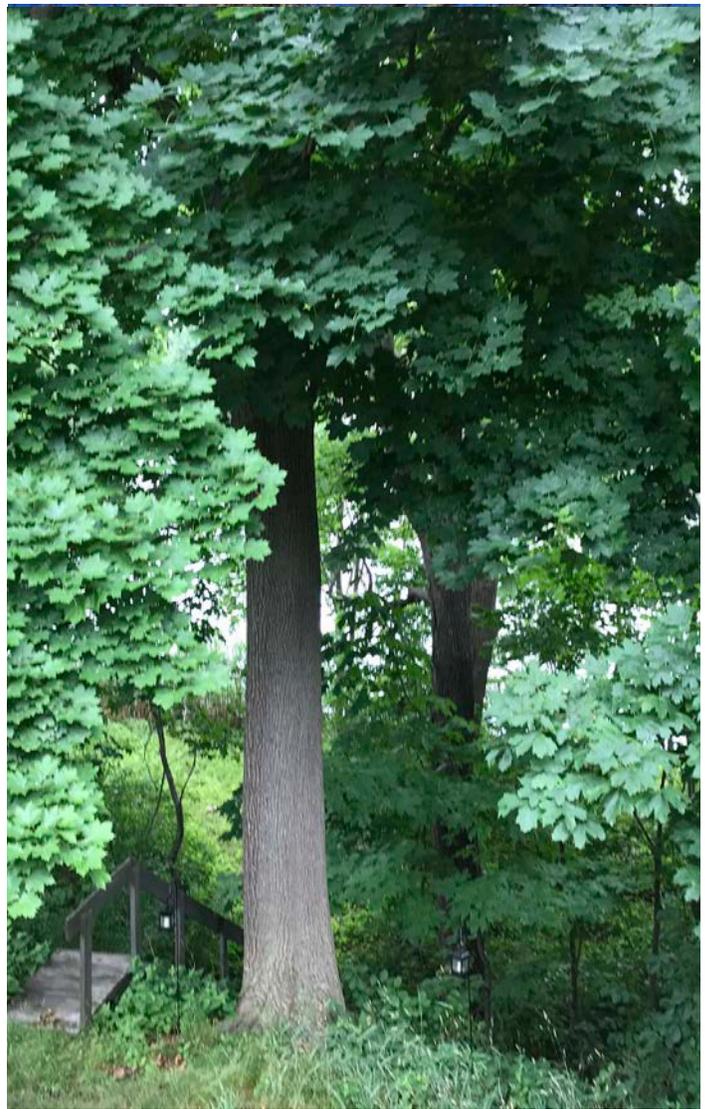
66 Burditt Ave Invasive Plant Images



A dense stand of Porcelain Berry at the top of the slope shades out previous plantings and threatens native understory



Sycamore Maple (left) next to a Norway Maple along the bank



Norway Maples casting dense shade on the North-facing slope



Morrow's Honeysuckle in fruit along the slope Northeast of the home



Bittersweet vines entangled in a Morrow's Honeysuckle can be damaging to mature trees if left unchecked



66 Burditt Ave
Invasive Plant Images



Burning Bush, *Evonymus alatus*, was historically planted along the edge of the lawn and has begun seeding itself into the woodland understory.



Dense shade caused by Norway Maples on the north-facing slope has led to little native vegetative growth on the slope and subsequent washouts. Cutting and treating the stems of invasives along the slope and replanting native shrubs can stabilize the slope



66 Burditt Ave

Invasive management techniques

We propose a combination of manual hand removal and cut & dab herbicide to control invasive plant species within the identified project areas over a phased time line. Once the initial identified invasive plant species have been removed by manual methods (described below), we propose seeding all exposed soil with native seed blend and begin planting identified tree, shrub and perennial plant species selected from the native plant community list that will increase the density and diversity of the existing wetland buffers.

Manual Hand Removal Methods:

Manual methods of invasive plant management will include hand pulling or cutting. To minimize soil disturbance, shallow-rooted invasive plants less than 1" in caliper will be hand pulled from the soil. Invasive plant species greater than 1" in diameter will be cut. All invasive plant material will be disposed of off site. Manual hand pulling and cutting will remove all invasive plants from the wetland buffer.

Cut and Dab application: All invasive plant species that have a base greater than 1" in caliper are proposed for herbicide application methods. Although invasive, the root systems of plants greater than 1" in caliper usually have extensive fibrous root systems, providing soil stabilization. So we propose a cut & dab method of application of a Triclopyr based herbicide (Garlon) or Glyphosate based herbicide approved for wetland use (trade name Rodeo) on individual cut stumps. Licensed Pesticide Applicators will complete all aspects of the proposed restoration.



Qualified applicators with necessary Personal Protective Equipment paint the stems of invasive species after cutting



Proposed cut stump treatment using hand tools and applying marking dye to eliminate possibility of treatment of stump twice, or missing stump entirely



66 Burditt Ave

Asiatic Bittersweet ID and Management

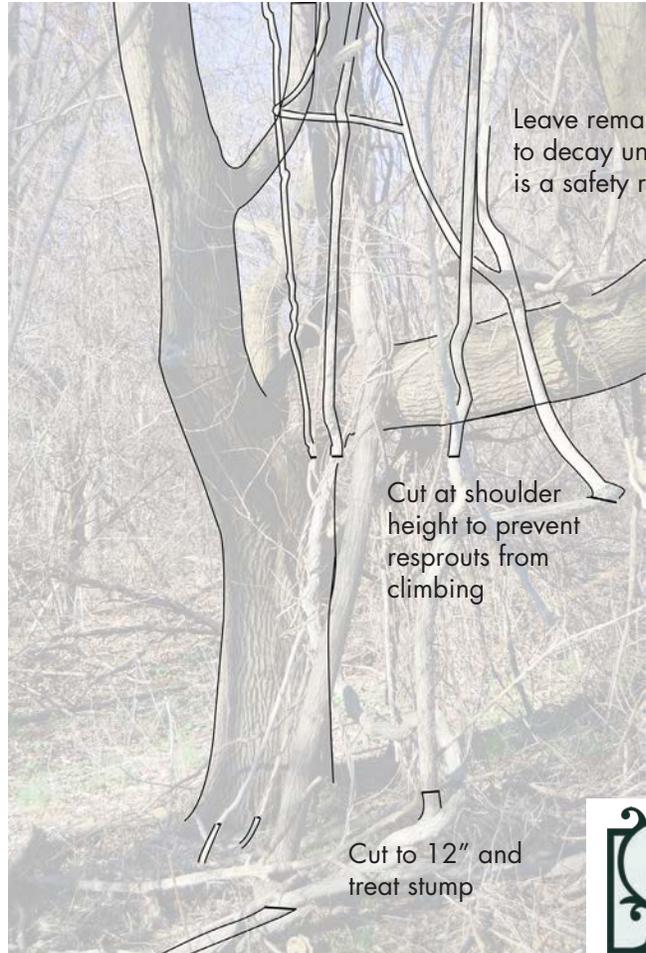
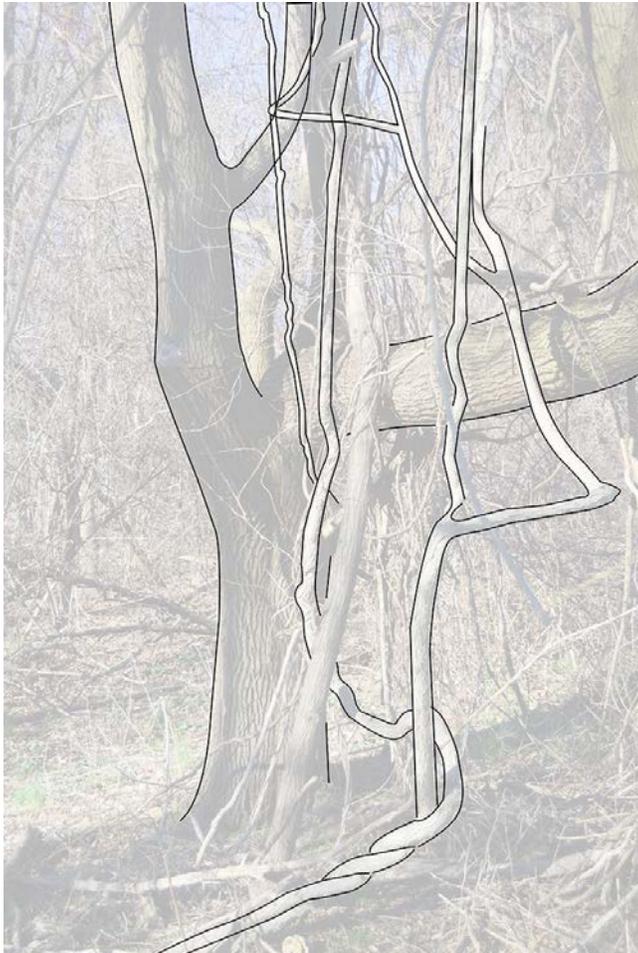
Invasive Bittersweet (*Celastrus orbiculatus*) and Grape (*Vitis* sp.) have the capacity to girdle, weaken, and even kill mature canopy trees. Without some frequency of removal, they will eventually open large holes in the canopy while suppressing saplings from filling the holes. They readily resprout after being cut and can damage the aesthetic and ecological value of meadows.

Mature stems produce thousands of bright red berries that mature in late fall and are spread by birds.

Removing the entire vines from trees is often dangerous and unnecessary (unless it poses safety risk). Our team recommends making cuts at shoulder height followed by a cut at 12" and immediate herbicide treatment. Bittersweet aggressively suckers after cutting so it is important to cut and treat during or after its flowering period (late June to December).



Identification: Alternate, circular light green leaves 2-5 in. long. Distinctive, large light colored vine. Red berries with orange casing appearing in late fall. Seedlings have light green leaves. Deep orange roots.



66 Burditt Ave Habitat Creation

Why is deadwood important?

Snags, large down logs and dead standing trees (dead wood) can be just as valuable if not more than living trees. They provide food, nesting cavities for birds, shelter for mammals, exposed bark for bats, nutrients for the soil and even moist forest floor for reptiles and amphibians. Some studies in the Northwest have shown the 40% of wildlife in old growth forests rely on dead wood for survival (Bartels, Knight). Unfortunately many natural spaces are kept clear of or are lacking dead wood to support habitat or simply grew after the land clearing of the 18th and 19th century and haven't matured enough to have a large supply.

In old growth forests in Oregon the density of dead snags is 10-18 snags per acre and 50-140 down logs per acre. This density is key to sustaining large populations of reptiles to providing space for nesting birds which are very territorial when snags are scarce.

Management impacts:

- When possible, dead trees and snags should be left standing in the natural area as long as they are not a safety risk. Special consideration should be given to trees greater than 25 inches in diameter which will support woodpecker cavities.

- Invasive trees to be removed can be cut to 12-20' above the ground to make them a safe, standing snag.
- Stacked invasive Buckthorn, Honeysuckle, Norway Maple and Sycamore Maple mimic the benefits of down logs and significantly increase shelter opportunities in areas where invasive species are being removed. Additionally, they limit removal of material off site, making the work more efficient and less energy intensive. These "Critter Condos" should be built 10-12 ft. across and 6' tall with larger branches on the bottom and taller on top. Ideally there are at least 2-3 piles per acre.



A "Critter Condo" reduces disposal energy while supporting shelter and food for wildlife



A large dead Sugar Maple houses a woodpecker



Management Calendar for Treatment and Planting

| Task | March/ April | May | June | July | August | Sept. | Oct. | Nov. | Dec. |
|---|-----------------|-----|------|------|--------|-------|------|------|------|
| <i>Remove Garlic Mustard and Lesser Celandine seedlings by hand</i> | | | | | | | | | |
| <i>Cutting of Glossy Buckthorn, Norway Maple, and Honeysuckle for creation of habitat piles by contractor</i> | | | | | | | | | |
| <i>Cut and dab of woody invasive species</i> | | | | | | | | | |
| <i>Invasive management in wetland areas</i> | | | | | | | | | |
| <i>Invasive vine management and cut and dab treatment</i> | | | | | | | | | |
| <i>Restoration planting</i> | | | | | | | | | |



Optimal timing and efficiency



Not optimal but mostly effective



Possible, but not ideal



66 Burditt Ave Native Plant Inventory

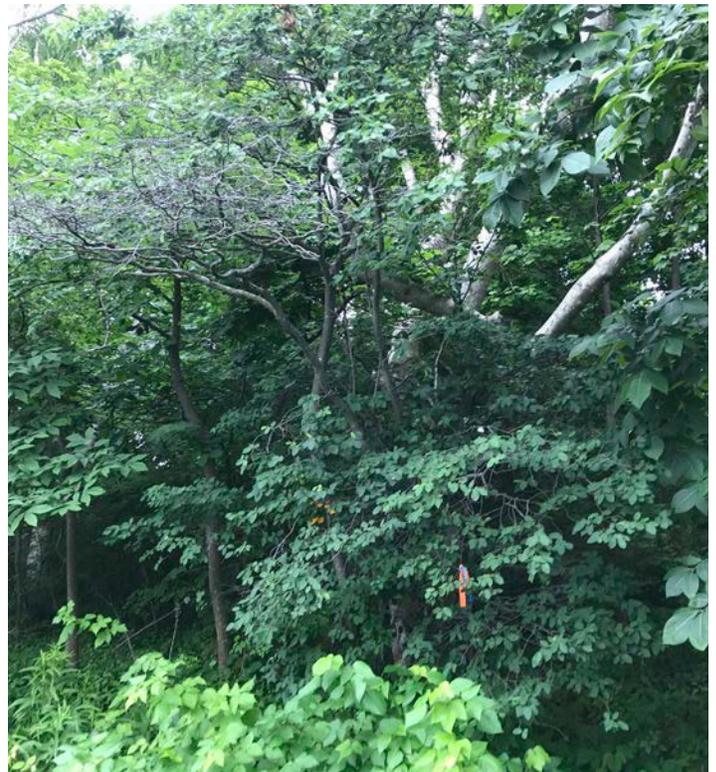
Within the wetland buffer is a diverse native plant community dominated by Red and White Oaks, Paper Birch, and Shagbark Hickory overstory, a Hemlock, Serviceberry, and Basswood understory with areas of dense White Wood Aster as a ground cover. We propose utilizing these existing native plant species as indicators of what naturally inhabits this plant community and propose additional planting of these species and diversifying with other wetland meadow wildflowers, native shrubs and trees.

Native Plant Species Identified:

Acer rubrum, Red Maple
Aster divaricatus, White Wood Aster
Amelanchier canadensis, Serviceberry
Carya ovata, Shagbark Hickory
Cornus racemosa, Gray Dogwood
Ilex verticillata, Winterberry
Lindera benzoin, Spicebush
Parthenocissus quinquefolia, Virginia Creeper
Prunus serotina, Black Cherry
Tilia americana, Basswood
Toxicodendron radicans, Poison Ivy
Quercus rubra, Red Oak
Quercus bicolor, Swamp White Oak



A Basswood Sapling along the water's edge. If permitted these can rise to a canopy tree with a deep taproot that supports the slope. The tree attracts a host of native bees, wasps and caterpillars that support bird populations



Native Downy Serviceberry and Shagbark Hickory are well established along the bank Northeast of the home



66 Burditt Ave

Native Restoration Strategies

Two mature Norway Maples are proposed for removal in the mitigation area northeast of the home. In accordance with Hingham Conservation tree removal guidelines one tree will be added to the 100' buffer for each removed Norway Maple. Below are proposed plantings in the mitigation 1:1 area and plantings proposed for additional installation after dense patches of invasive species have been replaced directly north of the home. Please see the detail on pg. 11-12 for proposed removal and the additional trees. After invasive plant species have been removed from the wetland buffer, the area will be planted with one to five gallon native conservation grade New England native trees, shrubs and herbaceous groundcovers from local seed and cutting sources. Additionally, we plan to use live stakes to form a dense shrub thicket to crowd out Phragmites over time (see detail pg. 15) It is proposed that native plants will have greater than 90% coverage by the conclusion of the 3 year Order of Conditions. Native plants proposed for installation along the ponds edge will add diversity of existing native plants, provide habitat and forage for wildlife, and reduce storm water and sediment flow into Broad Cove. Plants proposed for installation include:

| | Quantity | Size | Scientific name | Common name |
|--------------------------------------|-------------|-----------------------------|----------------------------------|---------------------------|
| Mitigation 1:1 Planting | 100 | 2" Plug | <i>Carex appalachia</i> | Appalachian Sedge |
| | 10 | 1 gallon | <i>Clethra alnifolia</i> | Summersweet |
| | 15 | 1 gallon | <i>Diervilla lonicera</i> | Northern Bush Honeysuckle |
| | 1 | 1.5-2" Cal. | <i>Hamamelis virginiana</i> | American Witchhazel |
| | 2 | 3 gallon | <i>Ilex verticillata</i> | Winterberry |
| | 2 | 5 gallon | <i>Prunus maritima</i> | Beach Plum |
| Additional Mitigation Planting | 2 | 1.5-2" Cal. | <i>Sassafras albidum</i> | Sassafras |
| | 1 | 1.5-2" Cal. | <i>Acer rubrum</i> | Red Maple |
| | 5 | 1.5-2" Cal. | <i>Amelanchier arborea</i> | Downy Serviceberry |
| | 14 | 1 gallon | <i>Aronia melanocarpa</i> | Black Chokecherry |
| | 2 | lb seed | <i>Aster divarcatius</i> | White Wood Aster |
| | 350 | 2" Plug | <i>Carex appalachia</i> | Appalachian sedge |
| | 39 | 1 gallon | <i>Clethra alnifolia</i> | Summersweet |
| | 100 | 2" plug | <i>Dennstaedtia punctilobula</i> | Hayscented Fern |
| | 4 | 3 gallon | <i>Ilex verticillata</i> | Winterberry |
| | 5 | 1 gallon | <i>Itea virginica</i> | Virginia Sweetpire |
| | 2 | 5 gallon | <i>Morella pennsylvanica</i> | Northern Bayberry |
| | 1 | 1.5-2" Cal. | <i>Quercus bicolor</i> | Swamp White Oak |
| | 3 | 1 gallon | <i>Sambucus canadensis</i> | Elderberry |
| 50 | Live Stake | <i>Sambucus canadensis</i> | Elderberry | |
| 3 | 1.5-2" Cal. | <i>Sassafras albidum</i> | Sassafras | |
| 9 | 3 gallon | <i>Vaccinium corymbosum</i> | High Bush Blueberry | |

After planting the conservation grade native shrubs and trees and slope stabilizing perennials, we propose the area be seeded with a Wetland Seed Mix and a Shady Wood Aster mix at recommended seeding rates. This dense, clump forming species will supply a matrix of vegetative growth to cover disturbed soils, and reduce recolonization of invasive plant species.

Species to be seeded include:

Fox Sedge, (*Carex vulpinoidea*), Lurid Sedge, (*Carex lurida*), Blunt Broom Sedge, (*Carex scoparia*), Sensitive Fern, (*Onoclea sensibilis*), Blue Vervain, (*Verbena hastata*), Hop Sedge, (*Carex lupulina*), Green Bulrush, (*Scirpus atrovirens*), Nodding Bur Marigold, (*Bidens cer-nua*), Bristly Sedge, (*Carex comosa*), Fringed Sedge, (*Carex crinita*), American Mannagrass, (*Glyceria grandis*), Wool Grass, (*Scirpus cyperinus*), Soft Rush, (*Juncus effusus*), Spotted Joe Pye Weed, (*Eupatorium maculatum*), Boneset, (*Eupatorium perfoliatum*), Mud Plantain, (*Alisma subcordatum*), New England Aster, (*Aster novae-angliae*), Rattlesnake Grass, (*Glyceria canadensis*), Purplestem aster (*Aster puniceus*), Soft Stem Bulrush, (*Scirpus validus*), Blueflag (*Iris versicolor*), Swamp Milkweed, (*Asclepias incarnata*), Monkey Flower, (*Mimulus ringens*). The functionality of each mix will remain unchanged, although mix composition may vary during the year.

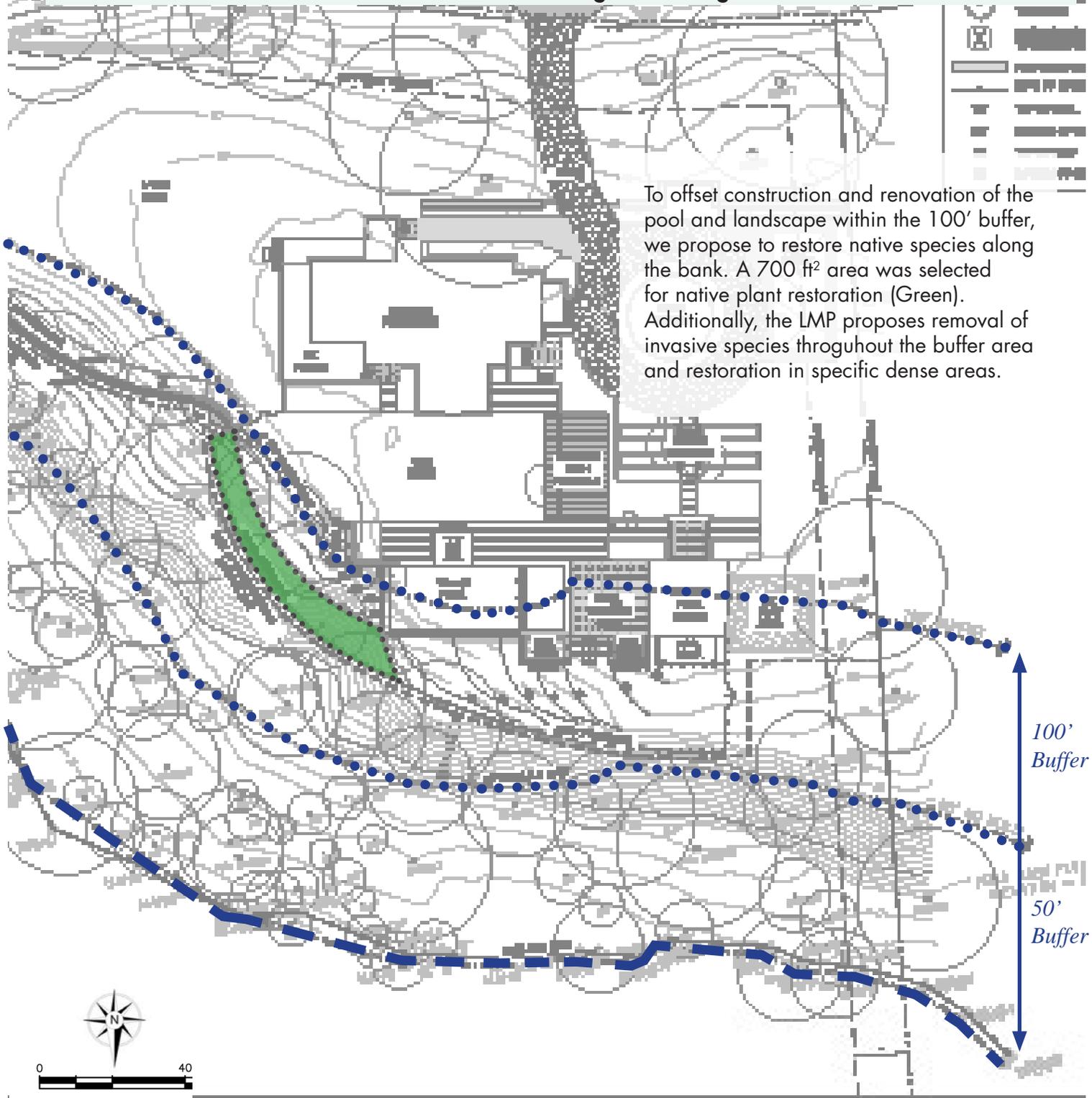


66 Burditt Ave

Native Restoration Strategies 1:1 Mitigation

| | |
|--|---------------------|
| | 1:1 Mitigation Area |
| | 100' Buffer |
| | 50' Buffer |
| | Pool |
| | Landscape |
| | Road |
| | Utility |
| | Building |
| | Tree |
| | Shrub |
| | Grass |
| | Bare Soil |
| | Water |

To offset construction and renovation of the pool and landscape within the 100' buffer, we propose to restore native species along the bank. A 700 ft² area was selected for native plant restoration (Green). Additionally, the LMP proposes removal of invasive species throughout the buffer area and restoration in specific dense areas.



1:1 Mitigation Area



66 Burditt Ave

Native Restoration Strategies 1:1 Mitigation

Indicated below are trees, shrubs and a groundcover to restore native plant communities to the mitigation area. Additionally, we recommend the removal of two mature Norway Maples which cast dense shade below the trees and chemicals in the roots restrict the growth of native vegetation. We propose cutting 2 Norway Maples (12" and 20"). As per the Hingham tree bylaw, (1) 1.5-2" caliper trees per tree removed will be added to offset removals. Trees will be cut to the stump and the stump will remain to support the slope. The removals will help stabilize the loose bank by providing light and growing space to diverse, ecologically-valuable native trees and shrubs



(1) *Prunus maritima*

(1) *Hamamelis virginiana*

(9) *Diervilla lonicera*

(1) *Prunus maritima*

(5) *Clethra alnifolia* and 100
Carex appalachia

(5) *Clethra alnifolia*

(2) *Sassafras albidum*

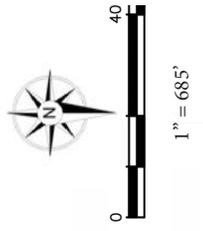
(2) *Ilex verticillata*

● Norway Maples to Remove



1" = 68.5'

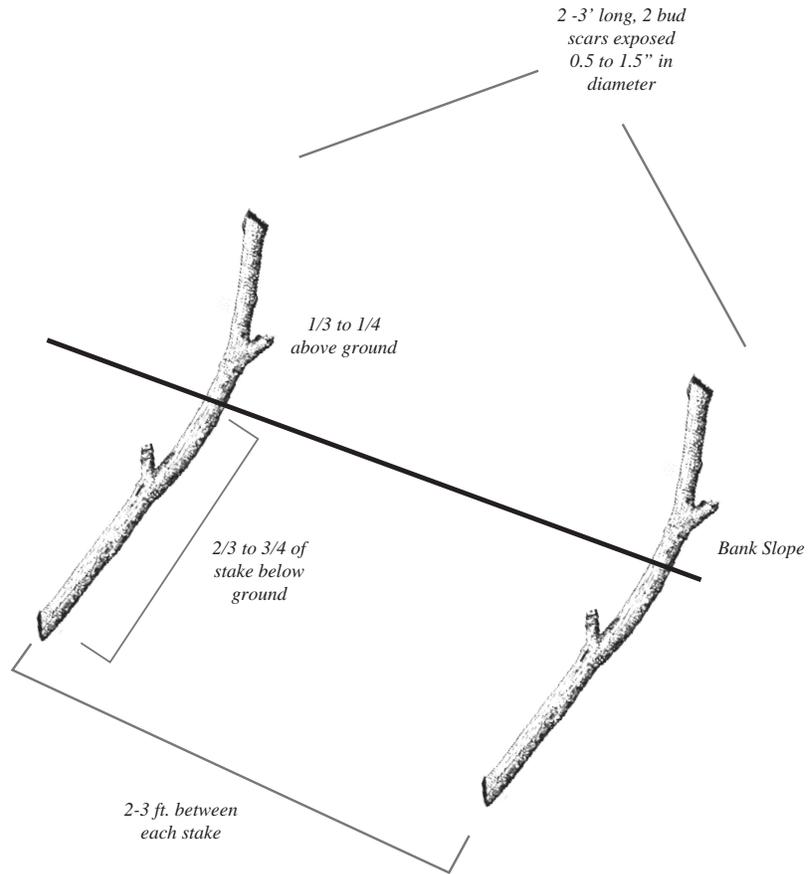
Beyond the 1:1 mitigation, the plan proposes removal of invasive species throughout the site and restoration in the densest, accessible areas. Along the North-facing slope, mature Norway Maples dominate the canopy. The dense shade below the trees and chemicals in the roots restrict the growth of native vegetation. We propose cutting 3 Norway Maples (8", 16" and 20"). As per the Hingham tree bylaw, (3) 1.5-2" caliper trees per tree removed will be added to offset removals. Trees will be cut to the stump and the stump will remain to support the slope. The removals will help stabilize the loose bank by providing light and growing space to diverse, ecologically-valuable native trees and shrubs



Live Stake Detail

Installing Live Stakes

- Live stakes are only installed successful while the twig is in dormancy. In New England, this window is generally between late October until the end of April the following year. They must be kept moist during and prior to installation.
- Stake rooting will be most effective if the stake is not positioned vertical but a little angled. Rebar or a pilot bar can be used to dig pilot holes to place live stakes in.
- Ensure at least half of the stake is below ground and 2 bud scars are exposed.
- Soil around the base of the stake must be tamped in for maximum stem-soil contact.
- If live stakes are planted in the fall, they should be covered with leaf mulch to protect from frost heaving. Leaf litter should be removed in early spring to prevent rot from occurring along the stems.
- For some species, root hormone can enhance establishment and can be added to the stem just before installing.



66 Burditt Ave Maintenance Schedule

The recommendations for restoration take into consideration the long term health of the bank. Once the invasive plant species have been managed in a locus area and any native plants installed, a long-term maintenance plan will be set in motion with the goal of continued control of invasive plant species on site, serve, and sustain native plant populations, and improve the native plant diversity and aesthetic beauty of the bank.

Fall & Winter 2020

- Complete invasive species management of Garlic Mustard and woody invasive plant species
- Identify and manually hand-pull identified invasive shrubs and vines under 1' in caliper, cut and dab invasives above 1" caliper
- Cut and remove selected Norway Maples, selectively prune other trees to allow light into the woodland
- Cut and dab herbicide application to invasive plant species that cannot be removed by manual methods of control
- Monitor for herbaceous invasive plants, including Garlic Mustard and Purple Loosestrife
- Begin planting native plant live stakes according to approved quantities and species
- Cover all disturbed soil along with native seed mix

Spring 2021

- Install restoration plantings in select areas
- Continue utilizing control methods of invasive plant management to exhaust seed bank
- Continue planting native plant species according to approved quantities and varieties
- Cover exposed soils with wetland seed mix

Summer - Fall 2021

- Monitor plant response and continue hand pulling and herbicide application methods on re-sprouting invasive plant species
- Continue planting native plant species according to approved quantities and varieties

2021

Ongoing Maintenance and Monitoring:

- After the treatments of fall 2021, the management plan should be re-evaluated. If management treatments have been successful, only monitoring and minimal hand removal should be required to keep invasive plant species from being reintroduced. Native trees, shrubs, and herbaceous forbs should dominate the wetland buffer.





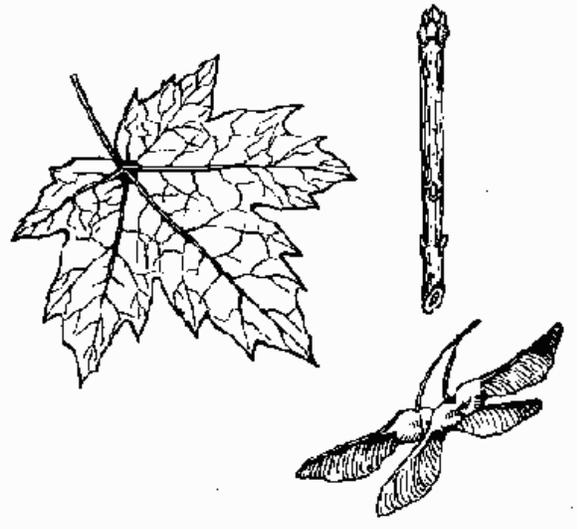
Norway Maple

Description:

Acer platanoides, Norway Maple is a tree occurring in all regions of the state in upland and wetland habitats. It is especially common in urban areas. It grows in full sun to shade. It out-competes native vegetation, including sugar maple, *Acer saccharum* which it is frequently confused with. Norway autumn color is yellow, while Sugar is orange/red. Norway has white sap, while Sugar has clear sap in the petiole (stems). Norway maple leaf points reduce to a fine "hair", while the tips of the points on Sugar leaves are rounded.

Habitat:

Norway maple is well adapted to various soils, grows in dry conditions, and can tolerate areas of soil pollution. Norway maples were widely planted in the United States as street trees and have escaped to natural habitats. Trees produce large numbers of seeds that are wind dispersed and invade natural areas, displacing native trees. Quickly establishing, they create a canopy of dense shade that prevents regeneration of native seedlings. Although thought to have allelopathic properties (meaning that the plant releases toxins that inhibit or prevent the growth of other plants), research has not been able to confirm this.



Management:

Manual methods of hand-pulling seedlings is recommended. For larger saplings, a 'Weed Wrench' is effective. Mature trees can be cut and the stump ground, or apply a Triclopyr based herbicide to the stump. Girdling the tree by cutting through the bark (cambium) layer all around the trunk is also an option. Girdling is most effective in spring and should include reducing the canopy for safety, but consider leaving trunks for habitat value.

Acer platanoides,
Norway Maple





Bittersweet

Description:

Celastrus orbiculatus, Asiatic Bittersweet is a deciduous climbing vine common in areas of disturbance in our New England forests. It has glossy, rounded leaves that are alternate with finely toothed margins. The leaves turn yellow in the fall. The fruiting plants produce small greenish flower clusters from leaf axils that mature in fall to produce high numbers of fruiting seed. The seed are noticeably yellow, globular capsules that split open at maturity to reveal red-orange fruiting seeds. Roots are also distinctly orange.



Habitat:

Bittersweet spreads easily into forest edges, woodlands, unmanaged meadows and old fields. Most disturbed sites that are not being actively managed that receive full sun are susceptible. The vine can tolerate shade but is often found in more open, sunny areas.



Management:

Asiatic Bittersweet management is a combination of manual hand pulling with cut & dab herbicide treatments. For established plants, vines should be cut to ground to reduce mass. Persistent root infestations will require repeat cutting and treatments over several seasons. Rake any seeds present, bagging in plastic bags, tying, and disposing of correctly.

Celastrus orbiculatus,
Asiatic Bittersweet





Honeysuckle

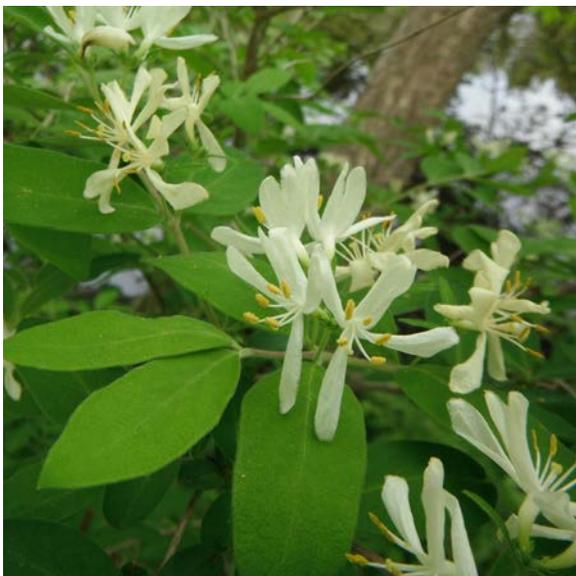
Description:

Lonicera morrowii, Morrow's honeysuckles are upright, deciduous shrubs that typically have a multi-stem mounding appearance. Oval leaves are opposite along the stem with smooth edges (no teeth or lobes) and hairy on the underside. Mature stems are often hollow on the interior and peeling on the outer bark. In the spring pairs of fragrant, tubular flowers less than an inch long are borne along the stem in the leaf axils. The fruits are red to orange, and fleshy .



Habitat:

Honeysuckles are relatively shade-intolerant and most often occur in forest edges, abandoned fields, and other open, upland habitats. Woodlands and open meadows, especially those that have been grazed or otherwise disturbed and are left unmanaged are also highly susceptible. Morrow's Honeysuckle have the greatest habitat diversity and are capable of invading wetland edges and other uncommon habitat types.



Management:

Morrow's Honeysuckle management is a combination of mechanical mowing and manual hand pulling with cut and dab herbicide treatments. When feasible, the root system is generally shallow and plants can be uprooted easily. Persistent root re-sprouting may require repeat cutting with herbicide application over several seasons to fully control.

Lonicera morrowii,
Morrow's Honeysuckle





Buckthorn

Description:

Frangula alnus, Glossy Buckthorn is a deciduous shrub that grows up to 20 ft. tall. The oblong leaves are up to 2" long, arranged alternately along the stem and are dark green on the surface, glossy above and slightly pubescent beneath. The leaves turn yellow in the fall, and remain on the plant when most other species have already lost their leaves. The yellow-green flowers are arranged in 1-8 flowered sessile, glabrous umbels. This plant flowers after the leaves expand, from May to September. The fruit ripen from red to black July to August.

Habitat:

Buckthorn thrives in early successional habitat. Abandoned agricultural or pasture lands, an opening in canopy within woodland, or unmanaged meadows are common areas. Buckthorn will also tolerate wetland soils where it can form dense stands that suppress the growth of native plant species. The seed is readily dispersed by birds, and the extended productivity of the fruit into winter allows the plant to be dispersed through the entire season.



Management:

Manual methods of hand-pulling seedlings is recommended. For larger saplings, a 'Weed Wrench' is effective. Mature Buckthorn can also be cut and the stump application of Triclopyr based herbicide. Rake any seeds present, bagging and disposing of correctly.

Frangula alnus,
Glossy buckthorn





Multiflora Rose

Description:

Rosa multiflora, Multiflora Rose is a shrub with arching canes with a mounding shape in the landscape. The leaves are divided into five to eleven sharply toothed leaflets. The base of each leaf stalk has a pair of fringed bracts which is a key identifier of the plant from other wild rose. Beginning in early summer, clusters of showy white flowers appear. The flowers are followed by developing red fruit, or hips, during the summer that remain on the plant through the winter.



Habitat:

Multiflora Rose thrives in early successional habitat. The rose has a wide tolerance for various soil, moisture, and light conditions. It occurs in dense woods, along river banks and roadsides and in open unmanaged fields. It can form a dense understory that suppresses growth of native plant species. The seed is readily dispersed by birds, and the extended productivity of the fruit into winter months allows wide spread distribution of the plant.



Management:

Manual methods of hand-pulling seedlings is effective. For more established shrubs, a combination of pruning to reduce mass followed by cut & dab treatments with a Triclopyr based herbicide is recommended. Persistent root infestations may require repeat cutting over several seasons. Rake any seeds present, bagging and disposing of correctly.

Rosa multiflora,
Multiflora rose



**Description:**

Japanese Barberry makes a dense, deciduous shrub understory that grows to 8 feet. Branches are brown, deeply grooved, zig-zag in form and bear a single sharp spine at each node. The leaves are small ($\frac{1}{2}$ to $1\frac{1}{2}$ inches long), oval shaped, green, bluish-green, or dark reddish purple. Flowering occurs from mid-April to May in the northeast. Pale yellow flowers about $\frac{1}{4}$ in. Across hang in umbrella-shaped clusters of 2-4 flowers along the length of the stem. The fruits are bright red berries about $\frac{1}{3}$ " long that are borne on narrow stalks. They mature during late summer and fall and

**Habitat:**

Japanese Barberry is shade tolerant, drought resistant, and adaptable to a variety of open and forested habitats, and disturbed areas. It prefers to grow in full sun, but will flower and fruit even in heavy shade. There is also strong research to support the surprise benefit of controlling Japanese Barberry in the reduction of black legged (or deer) tick populations.

**Management:**

Japanese Barberry is a prolific seed-producer with a high germination rate, so prevention of seed production should be a management priority. Barberry also spreads by rhizome, so underground root fragments should be removed. Manual methods of hand pulling sprouts works well in small populations, but large populations may require chemical applications by applying a 2% solution of glyphosate

Berberis thunbergii,
Japanese Barberry



IDENTIFICATION AND QUALIFICATION OF APPLICANT

This plan has been developed by Miles H. Connors, Director of Ecological Services at Parterre Ecological, a division of Parterre Garden Services. Parterre Ecological Services provides Land Management Planning, expert Invasive Plant Management services, Native Plant Restoration strategies, and ongoing Maintenance and Monitoring in natural area restorations.

PLAN AUTHOR AND QUALIFICATIONS

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Miles holds an Bachelor of Science degree in Environmental Planning and Policy and Biology, with a Masters of Science in Sustainable Landscape Planning and Design. Miles is also a Massachusetts Certified Horticulturist, holds an Invasive Plant Certification from UMASS Amherst and is a Licensed Pesticide Applicator.

Members of the Parterre Ecological team are licensed Massachusetts Pesticide Applicators, are Massachusetts Certified Horticulturists and hold an Invasive Plant Certification from UMASS Amherst.



Precedent Images of a Restoration Project completed in 2020



1. Existing Conditions - Client under an enforcement order to restore buffer after tree & shrub removal and hydroseeding turf



2. After installation of sediment control, we mechanically mowed area and seeded with New England Conservation and Wildlife Seed Mix



3. Covered exposed loam with straw erosion control blanket: BioNet S75BN and staple into existing slope



4. Layout native plant species suitable for an Oak Hickory Forest plant community



5. Native plant species installed: *Quercus rubra*, *Kalmia latifolia*, *Ostrya virginiana*, *Corylus americana*, *Betula lenta*, *Fagus grandiflora* and *Viburnum acerfolium*

