

Land Management Plan

Idylwilde Conservation Area
Lexington, MA

November 2014



Approved by the Lexington Conservation Commission on Monday, November 17, 2014



PARTERRE
ECOLOGICAL

IDENTIFICATION AND QUALIFICATION OF APPLICANT

This plan has been developed by Miles H. Connors, Manager of Ecological Services at Parterre Ecological, a division of Parterre Garden Services. Parterre Ecological provides invasive plant management, native plant restoration, and ongoing land monitoring.

Our mission is to restore plant communities to emulate, although not necessarily duplicate, habitat types that prevailed before disruption of natural processes. To accomplish this, we identify the dominant characteristics of existing native species on site, and determine what ecological community the fragmented plant composition may represent. Knowing that plant communities are always in a state of succession, we determine what trees, shrubs or herbaceous perennials are absent and introduce to complete the plant community.

PLAN AUTHOR AND QUALIFICATIONS

Miles H. Connors
Manager of Ecological Services
mconnors@parterregarden.com

Parterre Garden Services
67 Smith Place
Cambridge MA 12138

Miles holds an undergraduate degree in Environmental Planning and Policy and Biology, with a Masters in Sustainable Landscape Planning and Design. Miles is also a Massachusetts Certified Horticulturalist and a Licensed Pesticide Applicator.



Plant Inventory

Goal:

The goal of this plan is to identify and inventory existing plant communities. This will include invasive, likely invasive, and native plant populations with specific restoration practices over a phased timeline. Restoration goals will reduce invasive plant populations while diversifying the existing native plant community, improve biodiversity and wildlife habitat value, and encourage community members to use the site for passive recreation. This plan will assist the Conservation Commission in making management decisions for the Town of Lexington open space.

Definitions:

Invasive Plants:

As defined by the Massachusetts Invasive Plant Advisory Group, invasive plants are non-native species that have spread into native plant systems, causing economic or environmental harm by developing self-sustaining populations and dominating and/or disrupting those native systems. Invasive plant biology and physiology equip them with the means to out-compete native plants, disrupting native plant communities, and compromising the integrity of that ecosystem. Invasive plant species can alter hydrological patterns, soil chemistry, soil moisture retention, and can accelerate erosion. Many invasive plants lack fibrous root systems and often have allelopathic chemicals which inhibit the growth of surrounding vegetation, thus creating areas of bare earth which lead to faster rates of erosion and increased storm water runoff.

Likely Invasive Plants:

As defined by the Massachusetts Invasive Plant Advisory Group, likely invasive plants are non-native species that are naturalized in Massachusetts but do not meet the full criteria that would trigger an invasive plant designation.

Native Plants:

A native (indigenous) plant is one that occurs in a particular region, ecosystem, and habitat type without direct or indirect human action. Native plant communities improve the quality of wildlife habitat, while increasing biological diversity.

Existing Conditions:

Idylwilde Conservation Area is located in Lexington, Massachusetts between Middle Street and Lincoln Street. The property is bisected by an intermittent stream, dividing the project site from the larger open parcel that includes a community garden. In 2011, the community garden was relocated to its current location, from the project area. The project area is characterized by threatening infestations of invasive plant species, that should be managed to control increased plant species populations.



Idylwilde Conservation Area



Aerial view of Idylwilde Conservation Area, identifying the stream bank edge, old field meadow, residential edge, and property line.

-  Stream Bank Edge
-  Old Field Meadow
-  Residential Edge
-  Intermittent Stream
-  Property Line

Old Field Meadow

We identified the old community garden site and surrounding open meadow as an old field that is currently in an early state of succession. Visual identification of common herbaceous annual and perennial wildflowers and grasses that naturally occur in agricultural fields, meadows and old fields one to three years after agricultural practices are present. There are also remnants of the old community garden plants as well, including perennial mints, blackberries/raspberries, comfrey, and daylily.



Invasive Plants

<i>Aegopodium podagraria</i> ,	bishop's weed
<i>Alliaria petiolata</i> ,	garlic mustard
<i>Lonicera morrowii</i> ,	morrow's honeysuckle
<i>Lythrum salicaria</i> ,	purple loosestrife
<i>Rhamnus cathartica</i> ,	buckthorn
<i>Rosa multiflora</i> ,	multiflora rose

Likely Invasive

<i>Ampelopsis brevipedunculata</i> ,	porcelain berry
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Native or Naturalized Plants

<i>Ajuga reptans</i> ,	carpet bungleweed
<i>Convolvulus arvensis</i> ,	morning glory
<i>Eupatorium spp.</i> ,	Joe-pye weed
<i>Impatiens capensis</i> ,	jewelweed
<i>Onoclea sensibilis</i> ,	sensitive fern
<i>Phytolacca americana</i> ,	pokeweed
<i>Quercus alba</i> ,	white oak
<i>Ranunculus spp.</i> ,	buttercup
<i>Rubus spp.</i> ,	blackberry
<i>Solidago spp.</i> ,	goldenrod
<i>Ulmus rubra</i> ,	slippery elm



Old Field Meadow

Description

The old field meadow is located within the resource area of an intermittent stream. It is in early succession, with the pioneer plant community dominated by common annual weeds, and mixed with dominating species of perennial aster, goldenrod, and invasive purple loosestrife. There are patches of invasive multiflora rose, buckthorn, and honeysuckle taking hold, and the surrounding edges of the field are dominated by invasive species. If left unmanaged, the old field will continue to become colonized by woody invasive - native shrub and tree species.

Management Recommendations

Maintain the old field meadow ecosystem, as a plant community dominated by native wildflowers and grasses. In order to accomplish this, the old field meadow must be managed by mechanical brush mowing. All invasive plant species and pioneer saplings should be manually cleared from the field.

Native Restoration:

Once invasive plant species have been reduced from the old field meadow, a selection of native perennial grasses and wildflowers should be planted and seeded to rebuild the herbaceous layers. The native plant palette should be chosen to diversify the native plant community, contribute to wildlife resources, and stimulate interest from the community. All planting palettes should be approved by the Conservation Commission.

Mowing:

The old field meadow should be mown twice annually, once after July 1 after migrant songbirds have fledged and loosestrife is coming into flower, and after the first frost in early autumn. Care should be taken that the blade is set to cut all wildflower and grasses between 6" - 12" above the ground. Although the area is not large enough to accommodate ground nesting birds, it still holds valuable habitat for insects (an important food source of birds) that rely on the remaining shafts of grass for shelter during the winter months. In addition, the cut vegetation will provide nutrients to the soil, protect fragile new growth, and create cover for wildlife.

If the summer mowing regime is followed annually for (3) years, there should be a reduction in loosestrife and other invasive species populations, at which point, mowing may only be necessary once a year, excluding the annually mown paths. The open space should be valued as green space for passive recreational activities in the surrounding community.

Access and Circulation:

A wide mown pedestrian path linking Middle St. to Lincoln St. should be cut to create community connections. Secondary paths should also be considered for people to experience the different features of the site, linking the old field meadow to other destinations on the conservation land. Interpretive signage could help guide, attract, and educate visitors of the historic and natural features of the land, while discussing restoration practices taking place.



Stream Bank Edge

We identified plants in the canopy, shrub, and herbaceous layers along the intermittent stream. Identification of these plant communities indicated that both sides of the stream bank are dominated by the invasive *Acer platanoides*, Norway maple.



Invasive Plants

<i>Acer platanoides</i> ,	Norway maple
<i>Allaria petiolata</i> ,	garlic mustard
<i>Berberis thunbergii</i> ,	Japanese barberry
<i>Celastrus orbiculatus</i> ,	asiatic bittersweet
<i>Lonicera morrowii</i> ,	morrow's honeysuckle
<i>Polygonum cuspidatum</i> ,	Japanese knotweed
<i>Rhamnus cathartica</i> ,	buckthorn
<i>Rosa multiflora</i> ,	multiflora rose

Likely Invasive

<i>Ampelopsis brevipedunculata</i> ,	porcelain berry
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Native or Naturalized Plants

<i>Acer rubrum</i> ,	red maple
<i>Acer saccharinum</i> ,	silver maple
<i>Alnus viridis</i> ,	alder
<i>Betula populifolia</i> ,	gray birch
<i>Cornus stolonifera</i> ,	Red Stem Dogwood
<i>Fraxinus pennsylvanica</i> ,	green ash
<i>Juglans nigra</i> ,	Eastern black walnut
<i>Parthenocissus quinquefolia</i> ,	Virginia creeper
<i>Picea abies</i> ,	Norway spruce
<i>Prunus serotina</i> ,	black cherry
<i>Rubus spp.</i> ,	blackberry (cultivated)
<i>Toxicodendron radicans</i> ,	poison ivy
<i>Vitis spp.</i> ,	wild grape



Stream Bank Edge

Description

The stream banks are a vegetative buffer between the old field meadow and intermittent stream. This edge is dominated by the invasive Norway maple as a mast tree species, and has an invasive understory layer dominated by Asiatic bittersweet, morrow's honeysuckle, buck-thorn, and multiflora rose. The native *Cornus stolonifera*, Red Stem Dogwood, dominates the stream bank edge.

Management Recommendations

Both sides of the stream bank should be managed for restoration. To reduce invasive shrubs on both sides of the stream bank, manually hand cut and wipe with a Triclopyr based herbicide (Garlon). Or alternatively, a combination of mechanical brush mowing and prescribed grazing (by goats) over an extended timeline is also effective. Larger equipment should be limited in sensitive areas. The edible raspberry and blackberries, and other native edible plants, should be transplanted from the meadow to the stream bank edge, where cultivated berries should be retained for human and wildlife enjoyment and assist with bank stabilization.

Native Restoration:

Once invasive plant species have been reduced from both sides of the stream bank edge, a selection of native plants should be planted to rebuild the canopy, understory, shrub and herbaceous layers. The native plant palette should be carefully selected to diversify the native plant community, contribute to wildlife resources, and generate interest from the community. All planting palettes should be approved by the Conservation Commission.

Trees:

A local tree company should be contracted to remove a determined section of the Norway maple trees, and efforts made to utilize all parts on site. Trunks and logs cut from the Norway maples should be placed, partially submerged along the steep banks to mitigate soil erosion. Wood can be used to stabilize slopes and gullies, while providing habitat logs for forest floor amphibians. Fine branches can be used in specific locations, being scattered in a natural way, to increase the litter layer and slow storm water. Larger logs can also be used to provide appropriate access points on site, as a natural wood crossing (bridge), and wood chip surfaced pathways. The tree debris should be utilized on site as much as possible, cutting logs for reuse as benches, bridge construction, wood chip paths and habitat logs.

Snags, or dead decaying trees left standing to decompose, should be incorporated into the forested edge. Snags create den space for small mammals, perching sites for raptors, and cavities for nesting birds like woodpeckers and owls. The decomposing wood offers food for a myriad of insects and arthropods, fungi and other food web organisms. It is important to ensure all snags are located in areas of the stream bank edge where there is limited foot traffic, or remove limbs and cut snags to 20' tall in areas where foot traffic is present.

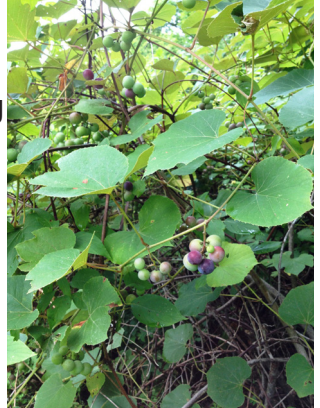
Access and Circulation:

Determine a crossing point along the intermittent stream that would provide a good location for natural wood crossing (bridge), to link the meadow area to the community garden site. A mown path from the meadow to the stream crossing should be maintained. A switch back woodchip path on the community garden side of the stream for pedestrian access should be maintained.



Residential Edge

We identified plants in the canopy, shrub and herbaceous layer along the abutting residential edge. Identification of this plant community found this edge dominated by *Acer saccharinum*, silver maple with *Ampelopsis brevipedunculata*, porcelain berry and *Vitis spp.*, and grape vine encroaching on the mature specimen trees.



Invasive Plants

<i>Acer platanoides</i> ,	Norway maple
<i>Celastrus orbiculatus</i> ,	asiatic bittersweet
<i>Robinia pseudoacacia</i> ,	black locust
<i>Rosa multiflora</i> ,	multiflora rose

Likely Invasive

<i>Ampelopsis brevipedunculata</i> ,	porcelain berry
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Native or Naturalized Plants

<i>Acer saccharinum</i> ,	silver maple
<i>Fraxinus pennsylvanica</i> ,	green ash
<i>Ulmus rubra</i> ,	slippery elm
<i>Vitis spp.</i>	grape vine



Residential Edge

Description

This edge is dominated by native silver maple, and green ash as a mast tree species. The invasive understory and shrub layer is dominated by grape vine, asiatic bittersweet, porcelain berry, and multiflora rose. The grape, porcelain, and bittersweet vine has established itself into a dense understory, reducing visibility of neighbors houses and the neighbors view of the conservation area.

Management Recommendations

In order to restore the residential edge, all invasive vines and shrubs should be cut at ground level and removed to a height of 8'. Dead vines remaining in tree canopy will eventually shed from the tree and become part of the forest floor. A combination of manual cutting and mechanical brush mowing, or alternatively, prescribed grazing (with goats) should be utilized to suppress growth.

Native Restoration:

Once invasive plant species have been reduced from the residential edge, a selection of native plants should be planted to rebuild the understory, and shrub layers. The native plant palette should be carefully selected to diversify the native plant community, contribute to wildlife resources, and generate interest from the abutting neighbors. All planting palettes should be approved by the Conservation Commission.

Trees:

A local tree company should be contracted to maintain the mature, dominating canopy of silver maples. Large limbs cut from the maples should be placed naturally on the forest floor, or stacked, providing habitat logs for forest floor amphibians. Wood chips from pruning should be spread along the residential edge to amend soils and cover exposed soils. The treatment of spreading wood chips as a mulch 1/2" to 1" thick encourages the development of soil fungi, which decomposes wood lignin and encourages organic matter, while suppressing weeds.

Snags, or dead decaying trees left standing to decompose, should be incorporated into the forested edge. Snags create den space for small mammals, perching sites for raptors, cavities could be excavated for nesting birds like woodpeckers and owls. The decomposing wood offers food for a myriad of insects and arthropods, fungi and other food web organisms. Make sure all snags have had limbs removed, and cut snags to 20' tall for safety.

Access and Circulation:

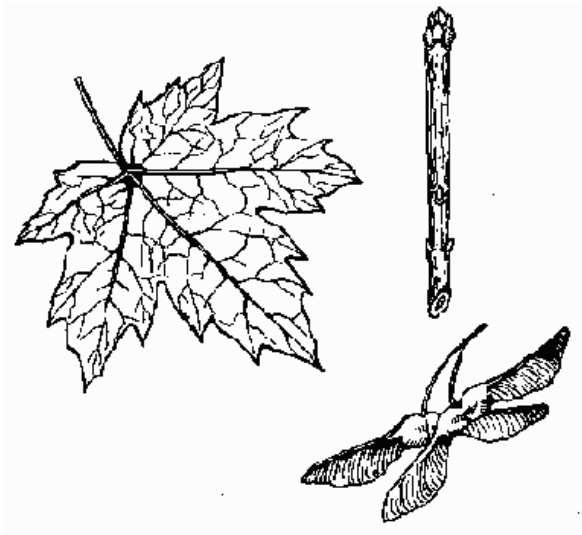
Determine property boundaries, and engage neighboring abutters in the restoration process. Approach the restoration to neighbors as improving their views of open space, returning the old field meadow to a flowering meadow, and providing open links to managed community garden space. Privacy of abutting neighbors should be considered.





Description:

Acer platanoides, Norway maple occurs in all regions of the state in upland and wetland habitats, and especially common in woodlands. It grows in full sun to full 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 the 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 maple leaves are rounded.



Habitat:

Norway maple is well adapted to various soils, grows in hot and dry conditions, and it can tolerate ozone and sulfur dioxide air 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 forests and forest edges. The dense canopy inhibits the regeneration of other tree seedlings, reducing forest diversity. Also, since Norway maple has shallow roots, it competes with other plants.



Management:

Manual methods of control works well in small populations by removing the entire root system. Larger, persistent infestations may require a combination of manual hand cutting, grazing, or cut stump herbicide treatments over a three to five year timeline. Larger trees in the landscape should be removed by Arborist.

Acer platanoides,
Norway maple





Description:

Goutweed, also known as bishop's-weed, is an herbaceous perennial plant. It is one of several species of *Aegopodium*, native to Europe and Asia. Most leaves are basal, with the leafstalk attached to an underground stem, or rhizome. The leaves are divided into three groups of three leaflets. The leaflets are toothed and sometimes irregularly lobed.



Habitat:

Goutweed is an ecologically versatile species. It is found in gardens, surrounding shrubs and other plantings, and in a variety of other disturbed habitats such as old fields. Goutweed appears to do best in moist soil and in light to moderate shade, but is highly shade-tolerant and capable of invading closed-canopy forests.



Management:

Small patches can be eliminated by careful and persistent hand-pulling or digging up of entire plants along with underground rhizomes. Pulled plants should be piled up and allowed to dry for a few days before bagging and disposing of them. Large patches can be controlled with systemic herbicides such as glyphosate (Roundup®) that are translocated to the roots and kill the entire plant.

Aegopodium podagraria,
Goutweed



**Description:**

Alliaria petiolata, Garlic mustard is a cool season biennial herb with stalked, triangular to heart-shaped, coarsely toothed leaves that give off an odor of garlic when crushed. First-year plants appear as a rosette of green leaves close to the ground. Rosettes develop into mature flowering plants the following spring. Flowering plants of garlic mustard reach from 2 to 3-½ feet in height and produce clusters of small white flowers, that when mature, produce thousands of seed.

**Habitat:**

Garlic mustard frequently occurs in moist, shaded soil of river and stream floodplains, forests, edges of woods, trails edges and forest openings. Disturbed areas are most susceptible to rapid invasion and dominance.

**Management:**

Hand-pull before flowering. The seeds of garlic mustard can remain viable in the soil for five years or more, so preventing seed production is key. Care must be taken to remove the plant with its entire root system, as new plants can sprout from root fragments. Pulled plants should be removed from site, especially if flowers are present (bagging in plastic bags, tying, and disposing of correctly).

Alliaria petiolata,
Garlic mustard





Description:

Berberis thunbergii, Japanese Barberry branches 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 to dark reddish purple. Flowering occurs in early spring. Pale yellow flowers hang in umbrella-shaped clusters of 2-4, along the length of the stem. When mature, the fruits are bright red berries about $\frac{1}{3}$ ", borne on narrow stalks. They mature during late summer and fall and persist through the winter.



Habitat:

Japanese Barberry is shade tolerant, drought resistant, and adaptable to a variety of open and wooded habitats, wetlands and disturbed areas. It prefers to grow in full sun to part shade, and can ultimately form a dense understory shrub layer.



Management:

Manual methods of control works well in small populations by removing the entire root system. Larger, persistent infestations may require a combination of manual hand cutting, grazing, or cut stump herbicide treatments over a three to five year timeline. *Berberis* is a prolific seed-producer with a high germination rate, prevention of seed production should be a management priority.

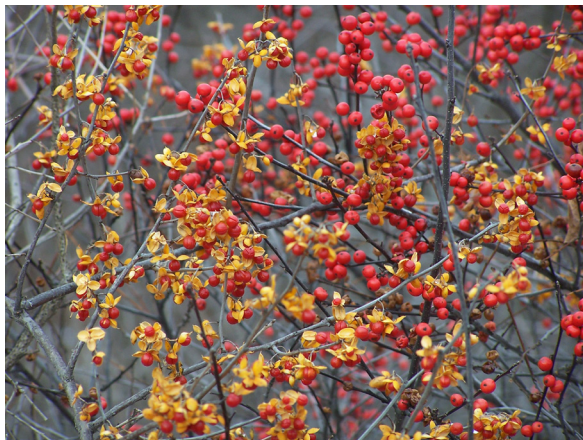
Berberis thunbergii,
Japanese barberry





Description:

Celastrus orbiculatus, Asiatic Bittersweet is a deciduous climbing vine. It has glossy, rounded leaves that are alternate with finely toothed margins. The leaves turn yellow in the fall. The female, fruiting plants produce small greenish flower clusters from most leaf axils that mature by September to produce high numbers of fruits and seeds. These fruits are yellow, globular capsules that split open at maturity to reveal red-orange seeds. Roots are distinctly orange.



Habitat:

Bittersweet spreads easily into forest edges, woodlands, fields, and most disturbed sites. It can tolerate shade but is often found in more open, sunny areas.



Management:

Manual methods of control works well in small populations by removing the entire root system. Larger, persistent infestations may require a combination of manual hand cutting, grazing, or cut stump herbicide treatments over a three to five year timeline.

Celastrus orbiculatus,
Asiatic bittersweet



**Description:**

Lonicera morrowii, Morrow's honeysuckles are upright, deciduous shrubs that range from 6 to 15 feet in height. The 1-2 ½ inch, oval leaves are opposite along the stem. Older stems are often hollow. Pairs of fragrant, tubular flowers less than an inch long are borne along the stem in the leaf axils. Flowering generally occurs from early to late spring, but varies for each species and cultivar. The fruits are red to orange, many-seeded berries. Stems are hollow of all exotic invasive, the native honeysuckles have solid stems.

**Habitat:**

Bush honeysuckles are relatively shade-intolerant and most often occur in forest edge, abandoned field, pasture, roadsides and other open, upland habitats. Woodlands, especially those that have been grazed or otherwise disturbed, may also be invaded. Morrow's honeysuckle have the greatest habitat breadth and are capable of invading most habitat types.

**Management:**

Manual methods of control works well in small populations by removing the entire root system. Larger, persistent infestations may require a combination of manual hand cutting, grazing, or cut stump herbicide treatments over a three to five year timeline.

Lonicera morrowii,
Morrow's Honeysuckle



**Description:**

Lythrum salicaria, Purple loosestrife is a perennial herb with a square, woody stem and opposite or whorled leaves. Leaves are lance-shaped, stalkless, and heart-shaped or rounded at the base. Plants are usually covered by a downy pubescence. Loosestrife plants produce a showy display of magenta-colored flower spikes throughout much of the summer. Flowers have five to seven petals.

**Habitat:**

Purple loosestrife is capable of invading many wetland types, including freshwater wet meadows, river and stream banks, pond edges, and reservoirs.

**Management:**

Large infestations of purple loosestrife plants in the meadow should be mechanically cut as the plant begins to flower.

Lythrum salicaria,
Purple loosestrife



**Description:**

Rhamnus cathartica, Common buckthorn is a shrub that can grow 22 feet in height and have a trunk up to 10 inches wide. When cut, the inner bark is yellow and the heartwood, pink to orange. Twigs are often tipped with a spine. In spring, clusters of 2 to 6, yellow-green, 4-petaled flowers emerge from stems near the bases of leaf stalks. Small black fruits containing 3-4 seeds, form in the fall. Leaves are broadly oval, rounded or pointed at the tip, and have jagged, toothed margins. Leaves appear dark, glossy green on the upper surface and stay green late into fall.

**Habitat:**

Common buckthorn prefers lightly shaded conditions. An invader mainly of open oak woods, deadfall openings in woodlands, and woods edges, it may also be found in prairies and open fields. It is tolerant of many soil types, well drained sand, clay, poorly drained calcareous, neutral or alkaline, wet or dry.

**Management:**

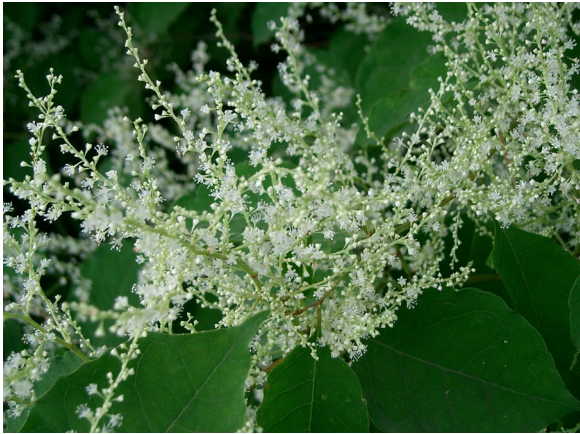
Manual methods of control works well in small populations by removing the entire root system. Larger, persistent infestations may require a combination of manual hand cutting, grazing, or cut stump herbicide treatments over a three to five year timeline.

Rhamnus cathartica,
Common buckthorn



**Description:**

Polygonum cuspidatum, Japanese knotweed is an herbaceous perennial that can grow to over 10 feet in height. Stems of Japanese knotweed have smooth, glossy green color mottled with red. Leaf size may vary, but normally about 6 inches long by 3 inches wide, broadly oval to somewhat triangular and pointed at the tip. The greenish-white flowers occur in attractive, branched sprays in summer and are followed soon after by small winged fruits. Seeds are triangular, shiny, and very small, about 1/10 inch long.

**Habitat:**

Japanese knotweed can tolerate a variety of adverse conditions including full shade, high temperatures, high salinity, and drought. It is found along streams and rivers, in low-lying areas, and disturbed areas. It can quickly become a dense mono-crop, out competing native understory plants.

**Management:**

Hand-pull sprouting root fragments. Any portions of the root system not entirely removed will potentially resprout. Population should receive a cut and wipe application of Garlon 4 Ultra, applied in late summer as the plant moves into flower.

Polygonum cuspidatum,
Japanese knotweed



**Description:**

Black locust is a fast growing tree that can reach 40 to 100 feet in height at maturity. While the bark of young saplings is smooth and green, mature trees bark is dark brown and deeply furrowed. Seedlings and sprouts grow rapidly and are easily identified by long paired thorns. Leaves are alternate along stems and are composed of seven to twenty one smaller leaf segments called leaflets. Leaflets are oval to rounded in outline, dark green above and pale beneath. Fragrant white flowers appear in drooping clusters in May and June.

**Habitat:**

Black locust is an early successional plant found in disturbed areas. The tree preferring full sun, well drained soils and little competition. Due to its rapid growth from root suckers or seed, black locust has been promoted by state and federal agencies and nurseries for many uses, including street tree planting.

**Management:**

Hand-pull seedlings and sprouts in uplands. Small infestations of young plants may be manually pulled by hand, preferably before root establishment. Black Locust is a colonizing plant, sending up root sprouts from its root system.

Robinia pseudoacacia,
Black locust



**Description:**

Multiflora rose is a shrub with arching canes, and leaves divided into five to eleven sharply toothed leaflets. The base of each leaf stalk bears a pair of fringed bracts. Beginning in early summer, clusters of showy, fragrant, white flowers appear. Small bright red fruits, or rose hips, develop during the summer, becoming leathery, and remain on the plant through the winter.

**Habitat:**

Multiflora rose has a wide tolerance for various soil, moisture, and light conditions. It occurs in dense woods, along stream banks and roadsides and in open fields.

**Management:**

Hand-pull all seedlings. For established plants, repeat cut or graze off canes to reduce mass and eventually eliminate growth with minimal soil disturbance.

Rosa multiflora,
Multiflora rose



Restoration Practices

A combination of manual, mechanical, prescribed grazing and herbicide treatments of invasive plants are recommended. As open space conservation land in the town of Lexington, there is an opportunity to utilize all methods for invasive management to maximize effectiveness, while educating the community. All restoration practices should be consistent with *Principles and Policies for Managing Lexington Conservation Land* prepared by Mass Audubon's Ecological Extension Service in fall 2014.

Manual Methods

Manual methods include hand pulling as well as use of a wide array of tools for cutting, and pulling. Manual methods should be used on woody invasive plants as seedlings. Eradication is only possible when the roots are completely extracted and seedlings are pulled or eliminated following seed germination. Because it is difficult to extract all of the roots of many invasive plants, re-sprouting usually occurs. Merely pulling small plants and cutting top growth will result in short-term control before stump or root sprouting occurs, unless an herbicide is applied to cut surfaces. If you do not plan to use herbicide, make sure an ongoing maintenance plan is in place to cut back, or graze, new growth continuously for an extended three to five years.

Mechanical Methods

In areas with dense infestations of invasive plant coverage, mechanical methods of brush mowing or tractors with special attachments is more practical. In utilizing mechanical methods, all native plants should be tagged before mowing begins. All freshly mown invasive stumps should be followed by herbicide applications. Timely treatment with herbicide is essential to cut stumps, as this disturbance creates favorable conditions for re-growth from seed bank and root sprouts.

Prescribed Grazing

Grazing relies primarily on goats to graze down and reduce dense infestations of invasive woody plant material. Grazing is an effective control treatment when there is no risk of damage to native herbaceous plants (goats are non-selective grazers), the invasive plant is palatable to goats (goats do not usually eat Black Swallow-wort), and is not poisonous to the animal. Also, multiple years are required to achieve major invasive reductions, and timing of grazing is critical to success. Once buds break in early spring, the invasive shrubs should be defoliated, and repeated throughout the growing season into late fall.



Brush mowing a forested edge dense with invasive plant material.



Herbicide Treatment Methods

An herbicide treatment program should be instituted during periods when invasive plants will translocate herbicide most effectively, and destroy root materials. Many invasive plants have extensive roots, and herbicide applications can offer effective means of control, because herbicides can selectively kill roots without disturbing soil.

Foliar Treatment

Herbicide treatment by direct foliar spray is one of the most effective methods of treating invasive plant material. With this method, herbicide mixtures are applied to the foliage. Foliar sprays can be applied whenever leaves are present but, are usually most effective from mid-summer to late fall. Apply a 2% Glyphosate (e.g., Rodeo for wetlands; Roundup for uplands) to leaves in late summer.

Cut Stump Treatment

The cut stump method involves applying herbicide in concentrate to the entire surface of freshly cut stumps. Treatments of herbicide should be applied immediately following cutting, with a paint brush. Freshly cut stumps of trees, woody vines, and shrubs can be treated with herbicide mixed at 20% Triclopyr (Garlon) to minimize, if not prevent re-sprouting. It is critical that the cut is made as low as possible to the ground, and that the stem is treated immediately after the cut is made. Invasive plants not treated with herbicides after cutting invariably re-sprout and intensify their infestation.



Cut stump treatment using a marking dye to eliminate possibility of treatment of stump twice, or missing stump.



Land Management Timeline

Winter 2014

- Remove all community garden debris. This includes, but is not limited to rocks from raised beds, signs, and pieces of metal fencing that would inhibit mowing.
- Open stone wall on Lincoln Road. Opening should accommodate a brush mower only, not a motorized vehicle.
- Manually remove shrubs and trees from Old Field Meadow.
- Brush mow Old Field Meadow.



Summer-Fall 2015

- Along the Residential Edge, cut and remove invasive shrubs. Wipe a 20% concentration of Triclopyr-based herbicide on the cut stem.
- Cut selected invasive Norway maple tree along the Stream Bank Edge, and treat with 20% concentrate of Triclopyr-based herbicide. Concentrate should have a marking dye, and be applied immediately following cutting.
- Cut and pre-treat all invasive shrubs by cut and wipe treatment with a 20% concentration of Glyphosate based herbicide. Concentrate should have a marking dye, and be applied immediately following cutting.
- Immediately seed exposed soil areas with red fescue to facilitate rapid colonization in order to reduce potential of erosion and storm water runoff from banks during storm events.
- Continue invasive plant management by using a selective, foliar spot treatment with a 2% Triclopyr-based herbicide to all sprouts from extensive root systems.



Winter-Spring 2016

- After mid-July, apply a foliar spot treatment to previously cut plants that resprouted from root systems.
- Monitor invasive plant response to prior season's management treatments and propose upcoming treatments to correspond with observed plant response.
- Utilize manual treatment methods of hand pulling invasive seedlings to exhaust seed bank.
- If invasive plants have been reduced by 80% or more than the original populations, propose restoration plantings.
- Install an automated temporary, above ground irrigation system to help restoration plantings become established.



Summer-Fall 2016

- After mid-July, apply a foliar spot treatment to previously cut plants that resprouted from root systems.
- Monitor for poison ivy in all project areas, removing any seedlings or vines that are in pathways or traveled areas.



Winter-Spring 2017

- Monitor invasive plant response to prior season's management treatments and propose upcoming treatments to correspond with observed plant response.
- Replace any native restoration plants that did not survive initial planting.
- Utilize manual treatment methods of hand pulling sprouting invasive seedlings to exhaust seed bank.
- Propose restoration planting.

Summer-Fall 2017

- Continue invasive plant management by using a selective, foliar spot treatment with a 2% Triclopyr-based herbicide to all sprouting from extensive root systems, and apply a 2% Glyphosate-based herbicide for all invasive shrubs sprouts.
- Install an automated temporary, above ground irrigation system to help restoration plantings become established.

Winter-Spring 2018

Ongoing Maintenance and Monitoring:

- After the treatments of 2017, the management plan should be assessed and re-evaluated. If management treatments have been successful, and populations of invasive plants are low enough that only monitoring and minimal hand removal should be required to keep invasive plant species from being reintroduced. After three consistent years of maintenance, monitoring, and treatment to invasive plant material, the management plan should be re-evaluated. Invasive plants generally take a minimum of three years of active management to reach a level of successful control. Monitoring and minimal maintenance should be ongoing.

Note on Herbicide Use: Herbicides should only be applied by knowledgeable, licensed and insured Massachusetts Pesticide Applicators. All Applicators must attend workshops and study materials in order to pass a written exam to become licensed in the state. Additionally, Applicators must obtain educational credits each year through attending additional courses in order to maintain licenses. Applicators are also required to show proof of liability insurance each year in order to remain licensed.

References:

"A Field Guide to Eastern Forests of North America". The Peterson Field Guide Series. John C. Kricher & Gordan Morrison. 1988.

"NHESP Natural Community Fact Sheet, Floodplain Forests". Massachusetts Natural Heritage and Endangered Species & Division of Fisheries and Wildlife.

Principles and Policies for Managing Lexington Conservation Land. Massachusetts Audubon Society Ecological Extension Service. 2014.

"Strategic Recommendations for Managing Invasive Plants in Massachusetts." Massachusetts Invasive Plant Advisory Group. February 28, 2005.

