

The Trail Adopter's Guide to Invasive Plants: The Fells Reservation

Introduction

Invasive plants are non-native plant species that are introduced into an ecosystem that dominate the plant system by disrupting the native ecosystem or damaging specific plant populations. Not all non-native plants are invasive but it is important to remember that introducing new plant species can be dangerous for an ecosystem. The Middlesex Fells Reservation is home to many non-native species most of which are not invasive. The varied terrain lends itself to many different types of ecosystems in the Fells. There are a few plant species however that are classified as invasive in the Fells. The best method to keep the Fells ecosystem healthy is to prevent the introduction of non-native species. Once non-native species are introduced and established it is difficult to eradicate them.

REMEMBER: Please do not remove any plants without consulting the DCR. DCR employees are the only individuals who are certified to remove/manage invasive species using herbicides. This guide gives instructions on identifying invasive species and removal.

Black Jetbead

Black Jetbead (*Rhodotypos scandens*) is a deciduous shrub that is found in all parts of Massachusetts. This shrub competes well with other native shrubs and it creates thick shrubbery which inhibits the growth and development of seedlings. Black Jetbead grows in full sun to full shade but grows best in full sun and well drained, but moist, soils. Black Jetbead is sustainable in varying soil densities and can withstand varying soil acidity as well as drought. The shrub is also resistant to shearing and pruning and adapts easily.

Black Jetbead tends to grow within five to seven feet and displays oppositely arranged, bright green leaves. The leaves are roughly two to four inches long and have double serrated margins. In spring, white flowers appear with four petals. The flowers bloom in terminal clusters and produce small, beady, black fruits that also appear in bundles of four.

To manage the growth of Black Jetbead there are two solutions: to remove the plants by hand or to use herbicides. To remove smaller shrubs by hand it is necessary to dig and take out the root system as well as the plant. The large shrubs can be cut to the ground in late fall or winter. An herbicide called glyphosate can be applied in spring.



Black Swallow-wort

Black Swallow-wort (*Cyanthum nigrum*) belongs to the Milkweed family and originated in Europe. It is now found all over New England, especially areas of full sun to partial shade such as fields, woodlands, roadsides, and floodplain edges. The rapid growth rate and dispersal of seeds by the wind helps to contribute to its spread. Black Swallow-wort can also re-sprout after cutting so it is important to remove the plant properly. This plant is especially dangerous to Monarch Butterflies who try to eat but are poisoned and die.

An herbaceous perennial vine, Black Swallow-wort has unbranched, horizontally growing stems that are roughly one to two meters in length along supporting vegetation. Leaves are short and opposite and they have short petioles. The leaf blades are shiny and ovate and the apex is tapered with heart-shaped or rounded bases. Six to ten axillary clustered flowers appear in June through September and the corollas show five fleshy, purple, triangle-shaped lobes with tiny white hairs. The fruits are green pod-like and slender, roughly four to seven centimeters that brown with age. Inside the fruits are flat seeds surrounded by white hair.

Managing Black Swallow-wort can be difficult but removal can be successful. To prevent the production of seeds, the seed pods should be mowed or hand pulled when they are forming. Any isolated Black Swallow-worts can be dug out. In late summer and early fall the herbicide glyphosate can be applied to the plant to help manage its growth and spread.



English Ivy

English Ivy is a vine that originates in parts of western Asia, northern Africa, and Europe that can be found today in parts of Massachusetts. The vine is shade tolerant although prefers more sun as it matures and it tends to avoid wet locations but requires slightly moist soils.

English Ivy grows in forest edges, fields, and salt marsh edges. It grows along the canopy and the ground competing with native vegetation at all levels of the forest and the vines prevent sunlight from reaching the trees.

English Ivy, the evergreen climbing vine, can grow up to 27 meters long and attaches to trees by way of aerial roots. The rootlike structures release a substance similar to glue which clings to the bark of the trees.

The leaves are cordate, dark green, waxy, have three lobes and are arranged alternately. Black, fleshy fruits that appear in spring hold stonelike seeds. English Ivy contains toxic chemicals that can cause vomiting and dermatitis in some individuals.

To remove English Ivy and control its spread, the vines must be hand pulled from the ground and root systems removed. Vines on trees must be cut and removed as well. As another method, the herbicide triclopyr may be applied to stop the spread of the vine.



Garlic Mustard

Garlic Mustard (*Alliaria petiolata*) belongs to the Mustard family and originated in Europe but is now found in every state in New England. It can grow in full sun to shade and grows best in moist, shaded floodplains, roadsides, forest openings, and trail edges. Garlic Mustard's ability to tolerate shade allows it to take over the forest understory. Just one plant can produce thousands of seeds that can be viable for up to five years. This plant threatens the reproduction of native butterflies who lay their eggs on native mustard plants.

Garlic Mustard is a biennial herb with a garlic odor that grows to be fifty centimeters usually but can grow up to one meter during its second season. In its first year it appears as a basal rosette with triangular or kidney-shaped toothed leaves and remains green through the winter. A mature plant shows coarsely toothed and wide kidney-shaped lower leaves and more triangular shaped upper leaves roughly three to six centimeters long. In the spring of its second year button-like flower clusters appear with five to six millimeter long cross shaped petals. In May through June, small four angled fruits appear containing shiny black seeds which survive through June and the dry seedpods can survive through the winter.

Garlic Mustard can be removed in multiple ways depending on the degree of infestation. For small infestations of Garlic Mustard hand removal of the root system and plant is enough. Medium infestation require stems to be cut a ground level to stop seed production. Only the heaviest infestations require an herbicide like Roundup. There are two alternate methods to manage Garlic Mustard. One method is using fire but fire is able to stimulate germination. Another method is to use insects that eat Garlic Mustard like weevils and one type of flea beetle.



Glossy Buckthorn

Glossy Buckthorn (*Frangula alnus*) also called European Buckthorn is a part of the Buckthorn family and it originates from Eurasia and North Africa. Today it can be found in all parts of Massachusetts and in every New England state. Glossy Buckthorn grows in full sun to full shade and tolerates moisture although it tends to grow in swampy areas, bog edges, woodlands, thickets, and old fields. As it grows, it forms dense shrubby layers which can interfere with the natural succession and regeneration of the land.

Glossy or European Buckthorn is a deciduous upright shrub that can grow to be roughly 6.1 m and has smooth grayish-brown bark that is speckled with lenticels. The leaves are arranged alternately and have an oblong, obovate, or elliptical shape. The leaves grow to be about 2.5 to 6.3 cm long shiny have parallel veins, full margins, and turn dark green that turns to yellow in the fall. Through May to September, yellow-green flowers appear in umbels of 1 to 8 and small fruits, juicy and round, ripen from red to black through July to October. An interesting trait of Glossy Buckthorn is the red-wine colored roots. The seed of Glossy Buckthorn can be dispersed over long periods of time which helps the plant to establish itself in an ecosystem.

Glossy Buckthorn can be managed by hand pulling before fruiting and in moist soil. Girdling is another method which cuts the bark and cambium of the stump and controlled fire can also reduce the spread of Glossy Buckthorn. The herbicides glyphosate and triclopyr can be applied and reapplied during fall to control growth.



Multiflora Rose

Multiflora Rose (*Rosa multiflora*) is part of the rose family originally from China, Japan, and Korea but can now be found in all parts of Massachusetts. Multiflora Rose can grow in full sun to full shade and tolerates a variety of soil and moisture. It can be found on roadsides, stream-banks, pastures, and mature, successional woods. The Multiflora Rose grows in dense thickets and bears fruits that are eaten by birds that help disperse the seeds over a large area. Each plant can bear roughly a half million achenes that can be viable for up to twenty years which makes the Multiflora Rose a threat in an ecosystem due to its long viability.

Multiflora Rose is a deciduous shrub that grows from 3-4.6 meters with arching red-green stems scattered with broad prickles. Leaves are pinnate and compound and are formed by five to eleven elliptic leaflets with sharply serrated edges. There is a comb-like fringe along the edges or margins of stipules. The stipules attach to petioles for more than half their length. Leaflets are a smooth, dark green on the top and are pale on the underside. In May through June, large pyramid clusters of pink to white fragrant flowers appear. In late summer, small, red elliptically shaped rose hips appear and contain achenes. The rose hips appear to leather with age and remain on the plant through the winter.

To manage Multiflora Rose by hand, mowing and/or cutting is necessary and must be done three to six times during the growing season for up to four years. The shrub can also be controlled with herbicides like glyphosate and triclopyr applied repeatedly. Two other methods are using Japanese beetles that eat the shrub and introducing the rose rosette disease which is a virus like disease that effects the growth of Multiflora Rose.



Norway Maple

Norway Maple (*Acer platanoides*) is a tree belonging to the maple genus that originates from Europe and Western Asia. Today, Norway Maple can be found all over Massachusetts. This tree tolerates shade and grows in dense stands to create a thick canopy that inhibits growth and regeneration of the lower levels of the forest. The Norway Maple prefers forests of moist alluvial soil and colluvial soil. Interestingly, the Norway Maple is the most planted tree in the United States because it naturalizes urban areas, floodplains, and forest edges.

The Norway Maple grows from twelve to eighteen meters on average but some trees can grow up to thirty meters. Its bark is gray with shallow grooves and the leaves are a dark green that turn yellow in the fall. Crimson cultivars yield dark red leaves in autumn. Oppositely arranged, the leaves grow to be ten to eighteen centimeters wide and display a cordate base with five to seven tapered lobes. Broken petioles release a milky sap. From April to May rounded, upright yellow-green umbels appear. Pairs of divergent samaras can be seen and are arranged at 180 degrees from each other.

Norway Maple seedlings must be removed in moist soil and large plants and their root systems must be removed. Large trees should be cut and the stump should be ground. A process called girdling can help prevent tree regrowth. To girdle a tree is to cut through the bark and the cambium around the trunk and works best when completed in the spring. Application of glyphosate or triclopyr can also inhibit growth and development of Norway Maple.



Oriental Bittersweet

Oriental Bittersweet is a deciduous vine but can also be a low shrub. Its origins are in Asia but it can be found today all over Massachusetts. Oriental Bittersweet grows in full sun to full shade but it prefers habitats like woodlands, coastal areas, early successional fields, and forest edges. The rapid growth of Oriental Bittersweet makes it a threat to native flora because it uproots native plants, breaks branches, and shades native plants. The vine also reproduces by way of root suckers and/or seeds.

Oriental Bittersweet comes in two forms: a climbing, woody vine that grows up to 18 meters or a low shrub whose roots appear orange. The stems of the plant are brown but gray with age and have wart-like lenticels. Newer twigs on the plant appear green and smooth. The leaves have short petioles and dulled serrated margins. They are alternately arranged and have a round or obovate shape. From May to June, two to three green flowers in each axillary cluster appear.

Beginning in July and ending in October yellow to orange capsules that hold three fleshy, ruby arils are visible and the arils each carry one to two seeds.

To manage the growth of Oriental Bittersweet there are two options. The first option is to hand pull the vine from its roots before fruiting and then bag the vines and leave them to dry out in the sun. Another method would be to apply triclopyr or glyphosate, both herbicides.



Porcelain Berry

Porcelain Berry (*Ampelopsis brevipedunculata*) is a woody, deciduous vine that originated in Asia but can be found today in southeastern and western counties of Massachusetts. Porcelain Berry can grow from full sun to full shade but prefers moist soils and partial sun. It tends to grow on railroad beds, highway shoulders, forest edges, shorelines, fields, and thickets. The dangers of Porcelain Berry are its high seed germination rate and rapid growth rate allow the vine to shade and smother native vegetation. The fruits are also buoyant which allows them to be easily carried by water and makes the spread of Porcelain Berry difficult to manage.



The vine Porcelain Berry can grow up to six meters and the twigs and petioles are coarse haired. Older stems of Porcelain Berry display tight bark with lenticels and white pith. Leaves are alternate and ovate with anywhere from three to five shallow to deep lobes. The leaves also have coarse-toothed blades and a hairy underside that is sometimes variegated. The vine has a few tendrils that lack sticky disks. In July through August yellow to greenish-white flowers that fork in cymes and appear opposite of leaves. The flowers themselves have five separate petals that appear bowl shaped near the nectar disk. Spherical, hard yellow-green or lilac fruits ripen in October and turn a blue, white, or mixed appearance.



Porcelain Berry can be managed by hand pulling to inhibit buds from flowering and the vine should be pulled before fruiting. Large vines should be cut close to the ground and should be cut repeatedly or an herbicide like triclopyr or glyphosate should be applied. For large populations of Winged Euonymus, glyphosate or triclopyr can be applied to manage growth.

Winged Euonymus

Winged Euonymus (*Euonymus alatus*) is a deciduous shrub that can be found all over the state of Massachusetts. It tolerates full sun to full shade environments which allows the shrub to invade and dominate forest under-stories. It also inhabits abandoned field, thickets, and roadsides. Winged Euonymus grows best in well-drained soil but has the ability to tolerate varying levels of acidity.

Winged Euonymus usually grows to be anywhere from one and a half to three meters but can sometimes grow up to six meters. There are many brownish-gray to green stems that have two to four corky wings. The Leaves are an elliptic, dark green with finely serrated margins and have almost no stalks. They are oppositely arranged along the stem and turn a reddish-purple in the autumn. In April through June small yellow, four-parted flowers appear on the shrub. Then, in late summer reddish-purple capsules burst that contain four orange or red arils which are a fleshy growth that surrounds the seed.

Winged Euonymus can be managed by hand pulling small seedlings but larger shrubs and root systems must be dug or cut. Glyphosate, an herbicide, should be applied to any remaining stumps. Glyphosate can also be applied to large population of Winged Euonymus. One last method of managing the shrub is by trimming all the flowers.



Important Vocabulary

achene- small, dry, one-seeded fruit
adventitious- root growing directly from the stem of a plant
alluvial- fertile soil formed by clay, silt, sand, and gravel deposits from streams and rivers
axil- the upper angle between a leaf stalk and the stem from which it grows
axillary- growing from the axil
biennial- blooms every other year
cambium- growing layer of the tree inside the bark
colluvial- accumulated soil and materials at the end of a steep slope
cordate- heart-shaped
cultivar- a variety of plant produced by breeding or cultivation
cyme- flower cluster with a central stem that bears a single flower which develops first and the other flowers develop into terminal buds or lateral stems
herbaceous- of or relating to herbs
leaflets- all of the leaf-like structures that form a compound leaf
lenticel- a raised pore in the stem of a woody plant for gas exchange
margins- leaf edge or border
petioles- the leafstalk that joins a leaf to a stem
pith- soft and spongy tissue
samara- winged nut or achene containing one seed
serrated- having a jagged edge
stipules- small leaflike appendage that usually appears in pairs at the base of a leaf stalk
variegated- displays different colors in irregular patches or streaks
umbel- flower cluster where stalks of equal length grow from a center and form a curved surface

Sources

Online:

http://www.na.fs.fed.us/fhp/invasive_plants/

<http://baystateforestry.com/>

<https://gobotany.newenglandwild.org/>

<http://www.massaudubon.org/learn/nature-wildlife/invasive-plants>

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/land-protection-and-management/invasive-species/invasive-plants.html>

Text:

[A Guide to Invasive Plants in Massachusetts](#)

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