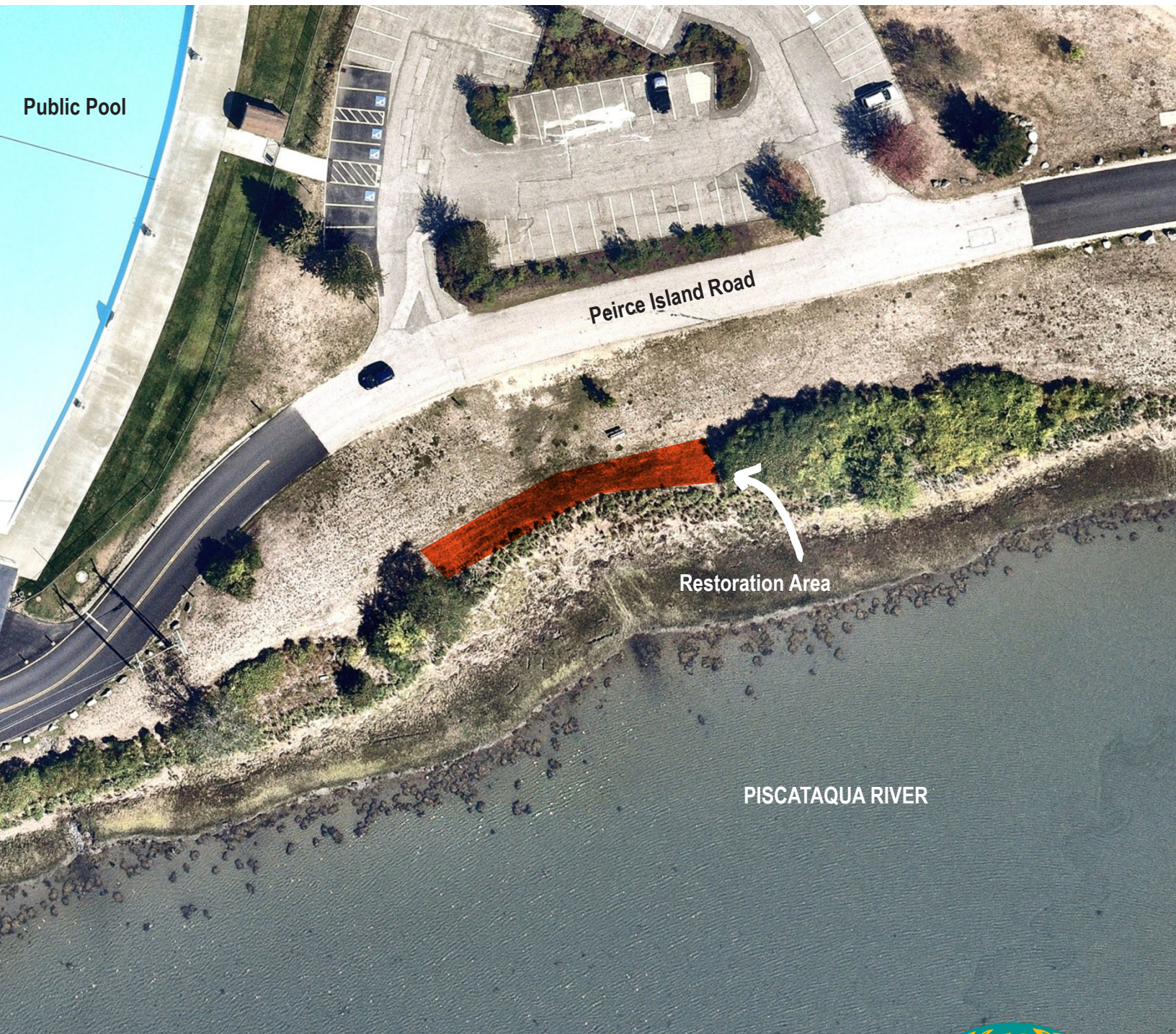


LAND MANAGEMENT PLAN

A NARRATIVE FOR INVASIVE MANAGEMENT & NATIVE PLANT RESTORATION AT TIDAL WETLAND SITE



PIERCE WETLAND BUFFER RESTORATION



PROJECT INTRODUCTION

This plan addresses a proposed invasive management and restoration planting at the Peirce Island Wetland Buffer restoration area in Portsmouth, NH. It is a small greenspace located across from the public pool parking lot.

The proposed restoration area is mostly grass and a small buffer of marsh elder along the coast. On either side of the restoration area there are mature trees, stands of Staghorn Sumac, and some invasive plants.

The invasive population on site is mature and self-perpetuating. These species will inevitably displace the remnant native population and establish in newly planted areas unless action is taken. The dominant invasive plants near the restoration site are multiflora rose and bittersweet.

The purpose of this plan is to identify the invasives plants we propose to remove, provide a description of each, and detail best management practices for control and management. The plan also includes a narrative for proposed native restoration, suggested plant species to restore the property, and an outline for planting methods.

Finally, this Land Management Plan provides a maintenance calender for all aspects of proposed management and ecological restoration over an extended timeline.

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A HUB FOR RECREATIONAL ACTIVITIES

Peirce Island is a hub for local activities. The outdoor pool built in 1937 is a beloved summer tradition for residents. Four Tree Island is connected to Peirce Island by a short causeway, this tiny neighboring island is a favorite spot for public grilling and picnics, offering a “tucked away” feel with great river views. There is even a popular scuba diving site off of Peirce island for experienced divers. The strong currents support a vibrant ecosystem of hydroids, anemones, and colorful nudibranchs.



Image from City of Portsmouth project scope packet.

EXISTING CONDITIONS: INVASIVE PLANT IMAGES



The Staghorn Sumac stand closest to the restoration area is being invaded by Bittersweet and Multiflora Rose.

EXISTING CONDITIONS: INVASIVE PLANT IMAGES



Bittersweet and Muliflora Rose growing in the understory of the Sumac.



Bittersweet vines strangle the trunk of a Sumac tree.



A small stand of native trees near the coast are being taken over by Bittersweet and Multiflora Rose.

EXISTING CONDITIONS: INVASIVE SPECIES INVENTORY

Peirce Island Wetland Buffer Restoration Invasive Plant Inventory

Invasive Pressure: High

INVASIVES/UNDESIRABLE NON-NATIVES:
TREES/SHRUBS/WOODY VINES

- Celastrus orbiculatus (Asiatic Bittersweet)
- Rosa multiflora (Multiflora Rose)

HERBACEOUS PLANTS

*Intake was performed in March of 2026. There may be other herbaceous invasive plants near the restoration area.



A view of the future restoration area from the salt marsh.

PROPOSED GENERAL INVASIVE MANAGEMENT TECHNIQUES

Important Note: The removal of invasive species can trigger the need for wetland permitting depending on the disturbance or activity levels necessary for removal. Please check your local city and state regulations to determine if your invasive removal method within a wetland or wetland buffer is an allowed method.

MANUAL HAND REMOVAL METHODS:

Manual methods of invasive plant management - including hand pulling and cutting - will be prioritized whenever possible. For tenacious woody plants, use of a weed-wrench is recommended. To minimize soil disturbance (which can activate invasive seed banks), only shallow-rooted invasive plants less than 1” in caliper should be hand pulled from the soil. Invasive plant species greater than 1” caliper are best cut and treated. Invasive plant material will be disposed of off site, chipped and spread, or piled discreetly in the woods as habitat piles.



Hand pulling invasives should be prioritized, however if the invasion is too established it will not be an effective way to completely eradicate the species from the area.

MECHANICAL MANAGEMENT:

Mechanical methods of invasive control include mowing, string-trimming, and sawing down of single large specimens or extensive stands of a particular plant. In a few cases repeated mowing or cutting is all that is needed to weaken a plant's resources to the point of die-off. With most aggressive invasives however, mowing and cutting are only the first step in a more intensive program plan that involves selective herbicidal treatments.



Mechanical mowing of a dense stand of phragmites.

PROPOSED GENERAL INVASIVE MANAGEMENT TECHNIQUES

City of Portsmouth Zoning Ordinance
Article 10.1018.25 Pesticides and herbicides: The use of pesticides or herbicides is prohibited in a wetland or wetland buffer, except that application of pesticides by a public agency for public health purposes is permitted.

CUT AND DAB TREATMENT:

All invasive plant species that have a base greater than 1” in caliper will be addressed with herbicide application. Invasive plants of this size usually have extensive fibrous root systems which provide beneficial soil stabilization and are best left in situ. Unfortunately, they also maintain the ability to resprout, which is why we propose a cut and dab method with Garlon 3A™ (a triclopyr-based herbicide) on individual cut stumps. Licensed Herbicide Applicators will complete all treatments.



Licensed applicators with required Personal Protective Equipment paint the **stems** of invasive species after cutting.

FOAM APPLICATION:

Some invasives, particularly persistent herbaceous plants like Japanese Knotweed, or resprouting woodies, are best managed with a foliar foam application. This technique allows the technician to systematically target the new green growth of a plant, where herbicide is absorbed most effectively. The foam adheres to the foliage and the herbicide is trans-located through the vascular system of the plant. Foliar foam wipes are best performed in late summer to fall when the plant is actively reserving energy in the rootstock.

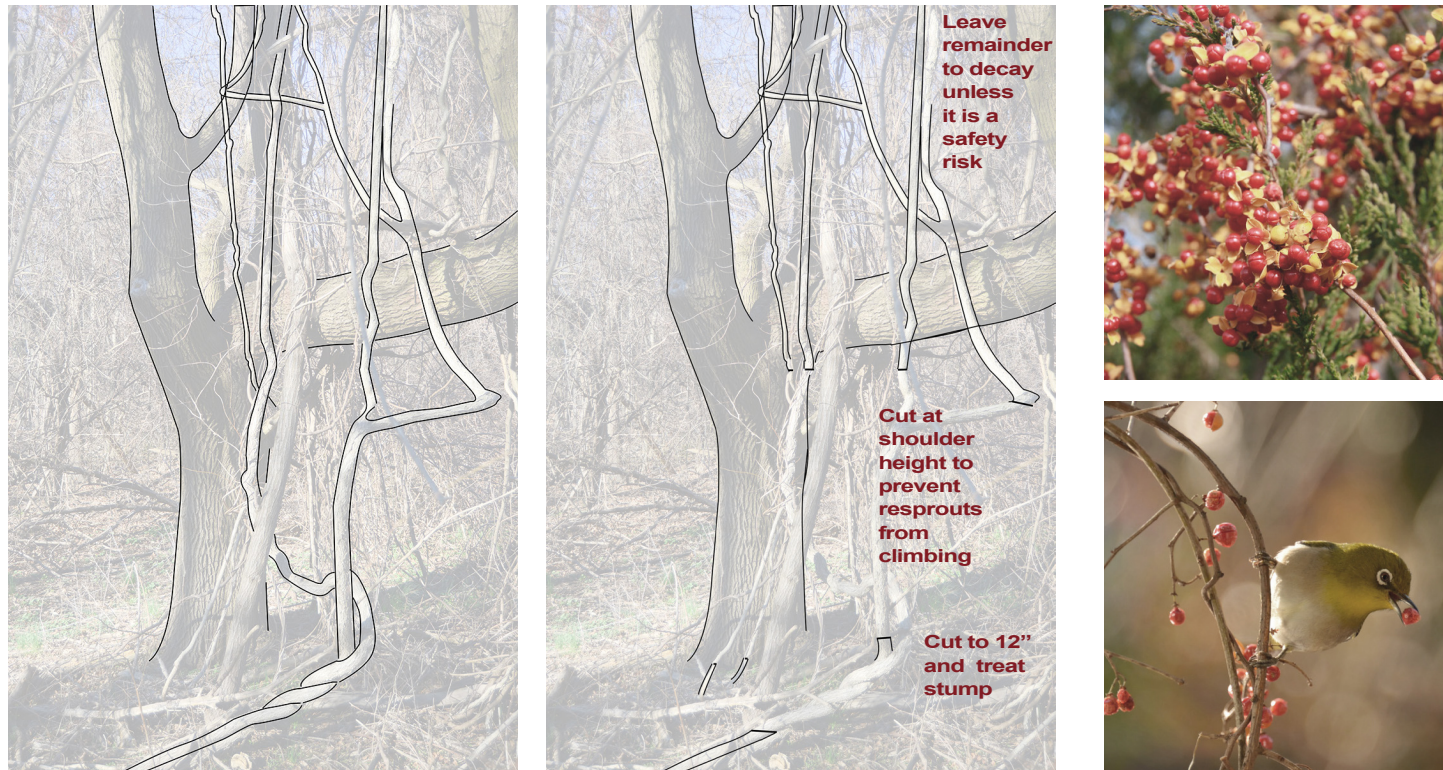


Licensed applicators with required Personal Protective Equipment foam the **foliage** of the invasive plant.

SPECIALIZED INVASIVE MANAGEMENT TECHNIQUES:
ASIATIC BITTERSWEET



Invasive Bittersweet (*Celastrus orbiculatus*) has the capacity to girdle, weaken, and even kill mature canopy trees. Without consistent management, vines will eventually open large holes in the canopy while suppressing saplings from filling the gaps. They readily resprout after being cut and can damage the aesthetic and ecological value of meadows and forests alike.



Removing the entire vines from trees is often dangerous and unnecessary (unless it poses safety risk). Best management practice involves 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).

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

EXISTING CONDITIONS: NATIVE PLANT IMAGES



Staghorn Sumac along the coast and near the restoration site.



Iva frutescens (Marsh Elder) seen here along the salt marsh.

EXISTING CONDITIONS: NATIVE PLANT IMAGES



Crab Apple branch and buds.



Black Cherry branch and buds.



Eastern Red Cedar, Black Cherry, and a Crab Apple are growing along the shore and near the restoration site.

EXISTING CONDITIONS: NATIVE SPECIES INVENTORY

Peirce Island Wetland Buffer Restoration Native Plant Inventory

NATIVES: TREES/SHRUBS/WOODY VINES

- Iva frutescens (Marsh Elder)
- Juniperus virginiana (Eastern Red Cedar)
- Malus spp. (Crabapple)
- Prunus serotina (Black Cherry)
- Rhus typhina (Staghorn Sumac)

HERBACEOUS PLANTS

*Intake was performed in March of 2026.
There may be other herbaceous native plants near the restoration site.



The future restoration site is shown here in between the stand of Staghorn Sumac and Eastern Red Cedars.

RESTORATION PLANTING RECOMMENDATIONS

Restoration planting will happen once a substantial amount of the Invasive Plant Management has occurred in the wild spaces on edges of the proposed restoration site. In the areas that are currently lawn, planting can happen immediately. In the wild areas where the invasive plant pressure is low, we recommend letting the existing native plants creep in and take over. Where the invasive plant pressure is moderate or high, we recommend replanting with native trees, shrubs, or perennials based on the soil type and sun exposure.

Marsh migration should be encouraged in this restoration effort. Because of sea level rise 'low marsh plants' (ex: *Spartina alternifolia*) are displacing 'high marsh plants' (ex: *Spartina patens*). These high marsh plants are facing barriers like steep slopes, coastal development, and invasive plants like phragmites which discourage marsh migration. The connection of the existing marsh and the upland areas of the Peirce Island restoration buffer will assist in the marsh migration from the Piscataqua River.



A Salt Marsh Sparrow is shown here enjoying a healthy saltmarsh ecosystem.

RESTORATION PLANTING RECOMMENDATIONS

MATTHEW CUNNINGHAM LANDSCAPE DESIGN

PROPOSED PLANT LIST

PROPOSED PLANT LIST				
ID	Qty	Latin Name	Common Name	Scheduled Size
PEIRCE ISLAND				
SHRUBS				
CP	1	Comptonia peregrina	Sweetfern	#3 cont.
MG	1	Myrica gale	Sweetgale	#3 cont.
MP2	1	Myrica pensylvanica	Northern Bayberry	5 gal. pot
PERENNIALS				
AT	1	Asclepias tuberosa	Butterfly Milkweed	#2 cont.
EDB	1	Eupatorium dubium 'Baby Joe'	Baby Joe Pye Weed	#1 cont.
SC	1	Schizachyrium scoparium 'Carousel'	Carousel Little Bluestem	#2 cont.
SS	1	Solidago ssp.	Goldenrod	#1 cont.
SR	1	Symphyotrichum oblongifolium 'Raydon's Favorite'	Aromatic Aster	#1 cont.

SHRUBS



Comptonia peregrina
Sweetfern



Myrica gale
Sweetgale



Myrica pensylvanica
Northern Bayberry

PERENNIALS



Asclepias tuberosa
Butterfly Milkweed



Eupatorium dubium
Baby Joe Pye Weed



Schizachyrium scoparium
Little Bluestem 'Carousel'



Solidago spp.
Goldenrod spp.

PERENNIALS



Symphyotrichum oblongifolium
Aromatic Aster 'Raydon's Favorite'

RESTORATION TECHNIQUES: PLUGS AND POTS

Many native herbaceous perennials and grasses are best installed as plugs, quarts, or even 1-gallon specimens for the more immediate coverage, impact, and stabilization they provide. They can be used to establish an herbaceous layer entire or overlaid in a matrix on a newly-seeded area. Container plants also allow for the creation of drifts and masses of plants in a way that simple seeding cannot. Planted correctly, their roots will quickly expand, stabilizing soils and creating an understory of healthy native vegetation.

PLANTING PLUGS

- » Plugs and container plants are small, with compact root systems, and must be kept moist at all times. Water thoroughly two to three hours before planting. This also facilitates laying out as the roots will not be as liable to dessicate.
- » Determine the spacing of the plugs. Dependent on species and container size, this could range anywhere from 8" to 3' on center, in a grid formation. If massing species together, take care to put taller varieties towards the "back" of the meadow or plot; shorter plants in "front".
- » Planting holes will be dug with a variety of tools - trowels, picks, soil knives, shovels, even augers, mechanical or otherwise (especially useful in highly compacted soil). The plug's or plant's crown should sit at soil level and be gently tamped down around its base. Water immediately, and continue to water on a regular basis the first year of establishment.
- » Whole plants will fill in more quickly than seeded areas, but weed pressure may still be high. Be vigilant in maintenance.
- » To limit soil disturbance you can dig a hole into sod and plant new plants directly into the existing vegetation. It is essential to string trim inbetween plants during the establishment period if this is the planting method.



Plugs and container plants will have dense root systems that must be kept moist.



MAINTENANCE TIPS: POST PLANTING

1. WATERING

To ensure newly installed shrubs and perennials survive and thrive they need to be watered often during the first season. It is imperative to keep the roots consistently moist as they establish themselves the first year. The second year you can scale back the watering pressure, and by the third year the plants should be resilient enough to survive on their own (with exceptions for extreme drought).

If you are installing plants in a restoration setting where irrigation isn't present or there are not any water sources to tap from, we recommend using watering bags on woody plants filled as needed using a portable water tank. If this is not an option, we recommend sourcing small restoration sized shrubs and smaller potted perennials. They need less water to establish, they adapt to the soil conditions faster, and they experience less transplant shock. Planting in the spring and late summer/fall would be highly recommended if the newly installed plants cannot be irrigated.



Tree Watering Bag



Organic Leaf Mulch

2. MULCH

Mulch helps keep the root systems of the newly installed plants cool and moist while also suppressing weed growth. We recommend mulching at a depth of about 2" of organic leaf mulch or an undyed bark mulch around the base of each plant.

3. WEEDING

Weeding after installing new plants is important because young plants are in their most vulnerable stage — and weeds are surprisingly good at stealing what they need to survive. Weeds compete, stress, and sometimes even smother new plants, slowing establishment and reducing long-term health. Efforts should be made to keep newly installed plants free of weeds. One good strategy to help keep weeds at bay is to consider adding a "green mulch" layer as a groundcover to fill in the gaps over time. This reduces weed pressure and eventually eliminates the need for bark mulch. Wild Strawberry (*Fragaria virginiana*) is a favorite green mulch plant, as it is very adaptable to many soil conditions and can grow in sun or shade.

MANAGEMENT CALENDER FOR TREATMENT AND PLANTING

TASK	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Hand removal woody seedlings < 1" caliper												
Hand pulling herbaceous species												
Mechanical management of woody invasives												
Cut and dab herbicide on woody invasives												
Japanese Knotweed Cutback												
Japanese Knotweed Chemical Treatment												
Restoration: Seeding												
Restoration: Planting												
Restoration: Live staking												

- Optimal timing and efficiency
- Not optimal but mostly effective
- Possible, but not ideal

The timing of various containment and restoration strategies is critical to their success. Fortunately, the calender provides ample opportunity for action at any time of the year. Tasks should be performed by trained ecological technicians and licensed herbicide applicators. These recommendations for restoration take into consideration the long term health of the Banfield Wetland Restoration. Once invasive plants have been managed in a particular area, the restoration of native species should begin.

MULTIFLORA ROSE
ROSA MULTIFLORA

DESCRIPTION:
Rosa multiflora (Multiflora Rose) is a mounding shrub with arching canes and leaves divided into 5–11 toothed leaflets. It's identifiable by fringed bracts at the base of each leaf stalk. Clusters of white flowers bloom in early summer, followed by red hips that persist through winter.

HABITAT:
Multiflora Rose thrives in early successional habitats and tolerates a range of soil, moisture, and light conditions. It forms dense thickets that suppress native plants and spreads widely through bird-dispersed seeds, with fruit persisting into winter.



MANAGEMENT:
Hand-pulling works for seedlings. For larger shrubs, prune to reduce size, then apply triclopyr to cut stems. Persistent roots may need repeated cutting. Collect and properly dispose of any seeds.

ASIATIC BITTERSWEET
CELASTRUS ORBICULATUS



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:
Small seedlings can be hand pulled, but bittersweet resprouts prolifically from root fragments, so more aggressive measures need be taken on all specimens but the very smallest. For established plants, vines should be cut to ground to reduce mass, but repeat cuttings will promote resprouting roots and should be avoided in most cases. Rake any seeds present, bagging in plastic bags, tying, and disposing of correctly.

