

Critical Plant Invasives and Their Removal

Center for Urban Restoration Ecology, School of Environmental & Biological Sciences

*Rutgers, The State University of New Jersey
Brooke Maslo, Ph.D*

Across all regions of the world, every ecosystem has formed over millions of years and has its own unique character. Through a series of both competitive and symbiotic interactions, each native species plays a role in the persistence of its ecosystem. For example, insects have developed specialist relationships with the plants of their region, either promoting the reproduction of a plant species through pollination or by holding a species' population in check through herbivory. Birds, in turn, moderate the insect populations so that no species can completely extirpate another. Birds also disperse plants by carrying their nutritious fruits far and wide, dropping seeds in new areas. These complex relationships have formed over time, with each species carving out a niche for itself and contributing to a rich, diverse, and productive ecosystem.

However, over the last 400 years, both plant and animal species have been transported by humans across the oceans and have settled in new habitats. Some species were transported deliberately, for horticultural purposes or simply to remind settlers of their old countries.

Other species, especially insects and microorganisms, were carried accidentally, as stowaways in cargo containers or in ship ballasts. Although some of these species did not reproduce successfully in their new regions, some have experienced population explosions.

Today, one of the biggest ecological threats to native habitats is the continued introduction and spread of invasive plant species. Invasive plant species have a competitive advantage over native species because they are freed of the insects, birds, and animals that eat them, and the resident wildlife in their new habitat has not evolved a way of overcoming the invasive plant's physical or chemical defenses. Therefore, their populations can grow unchecked in new habitats. Some species "leaf out" earlier and stay greener longer, creating and storing more energy. Therefore, these invasive plants can grow faster and produce more seeds than native plants. Because of these properties, invasive plants crowd out or strangle natives and often form dense monocultures over large areas. This loss of biodiversity leads to decreased habitat value for native wildlife (reduced food and shelter, depleted soil nutrients, clogged waterways, and increased erosion). Overall, invasive plants cause an estimated \$120 billion of environmental damage every year.

Tragically, our extensive knowledge of the damage caused by invasive species has not yet halted their sale in nurseries across the country. Unfortunately, the reasons these plants are invasive are the same reasons they are so popular in horticultural markets. They grow quickly, are deer and insect resistant, and they stay green for long periods of time. The problem is that the seeds these plants produce are carried into and destroy our natural lands.

The following pages provide information on some common invasive plants of the Northeast and mid-Atlantic regions, including identification, control measures, and native alternatives for your landscape. The more we do to increase the habitat value of our yards, the more we support our natural areas in overcoming plant invasion and persisting, with their valuable ecological services for us.

Invasive Plants for Sale

To assist in the fight against invasive plants, avoid purchasing the following plants from nurseries and garden centers. If you have these plants in your yard already, consider replacing them (either all at once or as existing plants die) with the suggested native alternatives.

NORWAY MAPLE *Acer platanoides*



Identifying Characteristics: Large, green hand-shaped leaf; milky sap inside leaf; yellow fall foliage.

Ecological Threat: Seedlings outcompete native trees; dense shade prevents growth of wildflowers.

Control Measures: Cut mature trees at the base, and immediately paint the stumps with glyphosate (Roundup® or similar). Hand pull seedlings or young saplings.

Native Alternatives: Red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), black gum (*Nyssa sylvatica*) - can grow to 60' and provide habitat for birds and small mammals; striking fall foliage.

Identifying Characteristics: Deciduous 3-6' shrub; leaves can be green to red, depending on the cultivar; bright red berries and spines along branches.

Ecological Threat: Deer resistant, forming impenetrable thickets in native forests and old fields; displaces natives; poor habitat value.

Control Measures: Cut stems horizontally at ground level, and immediately paint ALL cut stumps with glyphosate (Roundup® or similar). This species vigorously resprouts.

Native Alternatives: New Jersey tea (*Ceanothus americanus*) - 3', full sun or light shade; clusters of white flowers; Virginia sweetspire (*Itea virginica*) - 4-8', full sun to deep shade, white bottlebrush flowers.

JAPANESE BARBERRY *Berberis thunbergii*



Identifying Characteristics: Woody vine with brilliant yellow & red berries in clusters of 3-7 all along the stems.

Ecological Threat: Strangles trees & shrubs by constricting their stems & trunks; spreads quickly from one tree to the next.

Control Measures: In late fall, cut mature stems at the base, & immediately paint the stumps with triclopyr (Ortho MAX® or similar).

Native Alternatives: American bittersweet (*Celastrus americana*) - large red-orange fruits; Virginia creeper (*Parthenocissus quinquefolia*) - dark berries, brilliant fall color.

ORIENTAL BITTERSWEET *Celastrus orbiculata*



AUTUMN OLIVE *Elaeagnus umbellata*



Identifying Characteristics: Tall, deciduous shrub to 20'; grayish-green foliage; red berries with white speckles.

Ecological Threat: Displaces native plants by forming dense thorny thickets.

Control Measures: Cut mature trees at the base, and **immediately** paint the stumps with glyphosate (Roundup® or similar).

Native Alternatives: Blackhaw (*Viburnum prunifolium*), serviceberry (*Amelanchier canadensis*) - tall deciduous shrubs have dramatic fall color & berries. Excellent wildlife value.

Identifying Characteristics: Deciduous shrub to 12'; also known as "burning bush" due to its fiery fall color.

Ecological Threat: Forms a dense monoculture and displaces native plants.

Control Measures: Hand dig out smaller shrubs. Cut mature trees at the base, and **immediately** paint the stumps with glyphosate (Roundup® or similar).

Native Alternatives: Black chokeberry (*Aronia melanocarpa*) - deciduous shrub to 5'; large dark berries; highbush blueberry (*Vaccinium corymbosum*) - edible berries, needs acidic soils.

WINGED EUONYMUS *Euonymus alatus*



Identifying Characteristics: Evergreen woody vine, small clusters of white flowers, dark blue berries.

Ecological Threat: Forms dense mats in forests, preventing native plant growth; strangles large trees; NOT used by wildlife.

Control Measures: Hand pull vines from the ground. Cut thick stems along tree trunks and immediately paint stumps with glyphosate (Roundup® or similar). This plant's waxy leaves are not vulnerable to herbicides.

Native Alternatives: Shrub yellowroot (*Xanthorhiza simplicissima*) - deciduous shrub that is easy to grow in moist soils, small star-shaped flowers; scarlet honeysuckle (*Lonicera sempervirens*) - deciduous woody vine with striking coral tubular flowers. A hummingbird favorite!

ENGLISH IVY *Hedera helix*



JAPANESE SPIRAEA *Spiraea japonica*



Identifying Characteristics: Multi-stemmed 3-6' shrub; bright pink, flat-topped flowers.

Ecological Threat: Clonal species forms dense mats in many habitats, displacing natives.

Control Measures: Apply glyphosate (Roundup® or similar) to the leaves during warmer weather, prior to flower production. May need to repeat.

Native Alternatives: Shiny-leaf meadowsweet (*Spiraea betulifolia*), white spiraea (*Spiraea alba*) - clumped deciduous shrubs with clusters of white flowers.

Identifying Characteristics: Evergreen groundcover with early spring blue or white flowers; many varieties are available.

Ecological Threat: Clonal species forms dense mats along woodland floors, preventing the growth of tree seedlings & wildflowers.

Control Measures: Use a rake to raise the stems, then dig up or mow. Be careful to remove the entire plant, or the remaining stems & roots will resprout. Applying herbicides to small patches is also effective.

Native Alternatives: Barren strawberry (*Waldstenia fragarioides*) - trifoliate evergreen leaves, bright yellow flowers; creeping phlox (*Phlox subulata*) - creeping, evergreen groundcover with multiple pink flowers.

PERIWINKLE *Vinca major/Vinca minor*



Other Plants That May Be Creeping In...

The following group of plants has invaded both natural and human-modified landscapes. By eradicating these species from your property, you will increase its wildlife habitat value while reducing the seed sources available to colonize natural lands. Replacing invasive stands of plants with native plant material will help buffer your property against further invasion, but always be on the lookout.

TREE OF HEAVEN *Ailanthus altissima*



Identifying Characteristics: Deciduous tree to 90'; light gray, smooth bark, compound leaves with 12-30 leaflets; female produces papery wing-like fruits with a single seed in each.

Ecological Threat: Extremely fast grower with extensive root system; known to cause damage to building foundations; produces a chemical to prevent nearby plant establishment.

Control Measures: Seedlings can be hand-pulled. After root establishment, mechanical removal is extremely difficult. In late summer, cut the trunk horizontally at the base and immediately paint the stump with herbicide. The tree will resprout, so repeated efforts are required.

GARLIC MUSTARD *Alliaria petiolata*

Identifying Characteristics: Herbaceous biennial that forms cross-shaped white flowers in the 2nd year; triangular to heart-shaped coarsely-toothed leaves.

Ecological Threat: Deer resistant; dominates light, water, and nutrient resources from spring wildflowers, which are essential early spring food resources for a variety of wildlife.

Control Measures: Hand pull or mow small populations prior to seed formation. Larger infestations can be sprayed with glyphosate (Roundup® or similar) prior to seed set. Control measures should be repeated annually over 5 years to exhaust the seed bank.



PAPER MULBERRY *Broussonetia papyrifera*

Identifying Characteristics: Deciduous shrub or tree to 50'; variable leaf morphology from lobed to unlobed; female produces red flowers in June, which produce globular red fruits.

Ecological Threat: Fast growth quickly displaces native plants.

Control Measures: Hand pull or dig out small trees. Cut larger trunks horizontally at base and immediately paint the cut stumps with glyphosate (Roundup® or similar). May require repetition.



JAPANESE KNOTWEED *Fallopia japonica*



Identifying Characteristics: Bamboo-like stems; wide broad leaves, clusters of white flowers.

Ecological Threat: Reduces wildlife habitat in wetter areas, especially along streams; clogs waterways, often causing flooding.

Control Measures: Extremely difficult to control once established, so rapid response is prudent. Cut stems about 2in. above the ground and immediately apply a surface water friendly glyphosate herbicide (Rodeo® or similar). After plants resprout, repeat herbicide application.

JAPANESE HONEYSUCKLE *Lonicera japonica*

Identifying Characteristics: Perennial vine with opposite oval to oblong leaves and white, yellow, or pink tubular flowers; small black fruits.

Ecological Threat: Strangles shrubs and young trees; outcompetes other plants for light, water, and nutrients.

Control Measures: This plant actively grows after many native plants become dormant for the colder months, so apply glyphosate (Roundup® or similar) to the leaves in late fall.



JAPANESE STILTGRASS *Microstegium vimineum*

Identifying Characteristics: Annual grass to 3.5'; lance-shaped, pale green leaves; flowers July through October.

Ecological Threat: Aggressive seed-producer; stands quickly spread and create monocultures throughout woodlands; poor habitat for wildlife.

Control Measures: Hand pull or weed whack small populations and apply herbicide to large patches prior to seed set (early August); must be repeated annually for several year to exhaust seed bank.



MULTIFLORA ROSE *Rosa multiflora*



Identifying Characteristics: Tall, thorny shrub with arching branches; clusters of white flowers in June; red rose "hips" in late summer.

Ecological Threat: Forms dense, impenetrable thickets in fields and woodlands; displaces native plants.

Control Measures: Hand dig out small shrubs. For larger individuals, cut stems horizontally at ground level and immediately apply glyphosate (Roundup® or similar) to the cut stumps.

Further Action

Unfortunately, the above-listed species are only a small percentage of the total number of invasive plants that are threatening our ecosystems. But if we are conscious of what we plant in our yards, and if we take action against plant invaders that opportunistically colonize our property, we can make significant headway in the fight to save our native habitats. Table 1 provides a list of references for more information on the identification and control of invasive plants., and Table 2 lists some native plant nurseries in the mid-Atlantic region.

Table 1. Recommended Books on Invasive Plants and their Native Alternatives

Burrell, C.C. 2006. Native Alternatives to Invasive Plants. Brooklyn Botanic Garden, Inc., Brooklyn, New York.

Culina, W. 2002. Native Trees, Shrubs, and Vines: A Guide to Using, Growing, and Propagating North American Woody Plants. Houghton Mifflin Company, New York, New York.

Dunne, N. (editor). 2009. Great Natives for Tough Places. Brooklyn Botanic Garden, Inc., Brooklyn, New York.

Kaufman, S.R., and W. Kaufman. 2007. Invasive Plants: A Guide to Identification and the Impacts and Control of Common North American Species. Stackhole Books, Mechanicsburg, Pennsylvania.

Jones, Jr., S.B., and L.E. Foote. 1990. Gardening with Native Wildflowers. Timber Press, Inc., Portland, Oregon.

Leopold, D.J. 2005. Native Plants of the Northeast: A Guide for Gardening and Conservation. Timber Press, Inc., Portland, Oregon.

Randall, J.M., and J.M. Marinelli (editors). 1996. Invasive Plants: Weeds of the Global Garden. Brooklyn Botanic Garden, Inc., Brooklyn, New York.

Table 2. Regional Native Plant Retailers

Amanda's Garden	8410 Harper's Ferry Springwater, NY 14560	585-669-2275 www.amandagarden.com
Edge of the Woods	2145 Route 100 Orefield, PA 18069	www.edgeofthewoodsnursery.com
Gateway Garden Center	7277 Lancaster Pike Hockessin, DE 19707	302-239-2727 gatewaygardencenter.com
Nasami Farm and Sanctuary	180 Hemenway Road Framingham, MA 01701-2699	508-877-7630
Northeast Natives and Perennials	1716 E Sawmill Road Quakertown, PA 18951	215-901-5552
Pond Pro Aquatics	2433 Monmouth Road Jobstown, NJ 08041	609-723-4220 pondproaquatics@verizon.net
Redbud Native Plant Nursery	1214 N. Middletown Road Glen Mills, PA 19342	www.redbudnativeplantnursery.com
The Plantsmen Nursery	482 Peruville Road (Route 34B) Groton, NY 13073	607-533-7193 www.plantsmen.com
Toadshade Wildflower Farm	mail order	www.toadshade.com