RUTGERS UNIVERSITY
Cooperative Extension
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Invasive Plants and Native Alternatives for Landscapes

Michele Bakacs, Environmental and Resource Management Agent, Middlesex and Union Counties
William Errickson, Agriculture and Natural Resources Agent, Monmouth County

**Note that some historically used common names may be considered culturally insensitive. Where possible, we have listed alternative names or, in some cases, eliminated references to a country of origin. The part of the name that refers to the country of origin has been replaced with the term "Invasive."*

Summary

Many of the familiar plants we see in our woodlands, along roadsides, and in fields are not native to New Jersey and cause ecological harm. These "invasive species" grow out of control because they have no diseases or predators controlling their spread, and deer generally don't eat them. It's tempting to think that all green plants are good, but that would be a mistake when it comes to invasive plants. We can all help stop the spread of invasive plants by not planting them in our landscapes and by replacing existing invasives with native plant species. This fact sheet focuses on invasive plants that cause ecological harm to New Jersey's natural areas and native alternatives for landscaping and gardening. Tables 1-4 on pg 4 include lists of invasive plant species and suggested native alternatives.

What Are Invasive Plants and Why Are They a Problem?

Invasive species are defined as species that are non-native to an ecosystem and whose introduction causes or is likely to cause economic or environmental harm, or harm to human health. Invasive species can be plants, insects, animals, fungi, pathogens, or diseases. Some invasive plant species remain commonly available in the nursery and landscaping trade. Due to browsing by an overabundant deer herd and habitat fragmentation, these invasives are outcompeting native plant populations, and are spreading quickly throughout New Jersey.

Unchecked invasive plants rapidly invade natural areas, often forming monocultures (communities of just one plant), and outcompete diverse, native plant communities. For example, an upland Oak-Hickory forest of northern New Jersey with an intact native plant community can support dozens of species, including herbaceous plants (i.e., Mayapple, Wood anemone), understory shrubs (i.e., Viburnums, Spicebush), and trees (i.e., Red oak, Black cherry, Red maple, Pignut hickory). These forests offer flowers, fruit, and seeds from different species throughout the year, which in turn provide food and habitat for wildlife, including pollinators, songbirds, and small mammals. When that

Native Plant Names: Is It a Weed or Not?

Native plants are those that occur historically in an ecosystem and have thrived without help from humans. Native plant names can be confusing. Sometimes the common name may include the term "weed" in it. For example, "Joe-Pye Weed" or "Butterfly Weed." Even though they have "weed" in their name, they are still essential for providing habitat and food for migratory birds, butterflies, pollinators, and other wildlife. New Jersey has more than 2,000 native plants that are a beautiful addition to any landscape.

*Figure 1: A New Jersey forest where the understory is dominated by Berberis thunbergii (*Invasive barberry) a popular ornamental shrub often favored because deer do not eat them.*

community is invaded by an invasive plant, for example, Burning bush (*Euonymus alatus*, a widespread invasive shrub), native plants are pushed out and biodiversity decreases. As there are no natural biological controls (insects or diseases) to keep the invasive population in check, one species dominates, leading to limited food and habitat for wildlife. The result is a 'broken food web.' In other words, plants form the basis of the food web, and populations of native insects and birds decline when invasive plants dominate the landscape.

In addition to the impacts to wildlife, homeowners have to spend time and money removing invasive plants. Staff time and money are diverted to managing invasive plants in parks and public lands. Scenic vistas change as invasive vines smother natural features and girdle trees. Forest succession is impacted as young tree saplings are smothered by invasive shrubs and vines. Lakes and ponds are clogged with aquatic invasives, changing water chemistry and impacting boating and fishing.

What Causes Invasive Plants to Spread?

Habitat fragmentation and disturbance are part of the reason for the invasive plant problem. Another major cause is the increase in white-tailed deer populations, which have skyrocketed in New Jersey from a normal average of 10-20 per square mile to more than 100 per square mile, in some cases (NJDEP, 2019). Deer rarely eat invasive plants, which leads to heavy browse pressure on their natural diet of native plants. Under historic deer abundance or within deer exclosures (areas fenced off from deer), native plants compete well with invasives for space and light. However, few native plants can grow to maturity when they are continually browsed, giving invasives an added advantage.

Invasive plants are not a new problem impacting our natural resources. The first notable invasions occurred in the 1950s but began to rapidly increase over the last 50 years, coinciding with the rapid increase in deer abundance starting around 1970. But from nature's perspective, 50 years is just a blink of the eye. More common invasives, such as *Invasive barberry (*Berberis thunbergii*), Multiflora rose (*Rosa multiflora*), and two invasive Wisteria species (*Wisteria sinensis* and *Wisteria floribunda*) have been present for decades. These species are considered widespread and can only be controlled locally, on a site-by-site basis.

Non-native species that are showing signs of spreading but have yet to become widespread are called emerging species of concern. An effective approach to prevent new, emerging species from becoming widespread is known as "early detection/rapid response" (ED/RR). This approach is supported by the invasion curve (Figure 3), which indicates that eradication is only feasible at the earliest stages of invasion.

How Can You Avoid Invasive Plants in Yards and Landscapes?

Many of the attributes the public looks for in commercially available garden plants might also make them candidates to become invasive species. These attributes include adapting to many different site conditions, tolerance of poor soils, abundant flowers and fruit, fast growing, and insect and deer resistance. Many states, including New York, Pennsylvania, Connecticut, Massachusetts, New Hampshire, and Delaware, have banned the cultivation and sale of certain invasive plants. These include more widespread species, such as *Invasive barberry (*Berberis thunbergii*) and Burning bush (*Euonymus alatus*).

Landscapers, property managers, and residents can have an impact on the spread of invasive plants by choosing native plants that support habitat and replacing known invasives. A few of New Jersey's invasive species of concern and native plant alternatives are listed in the tables 1-4 on pg 4. In addition to this list, native plant nurseries carry a wide selection of native plants and can provide recommendations on alternatives to invasive species.

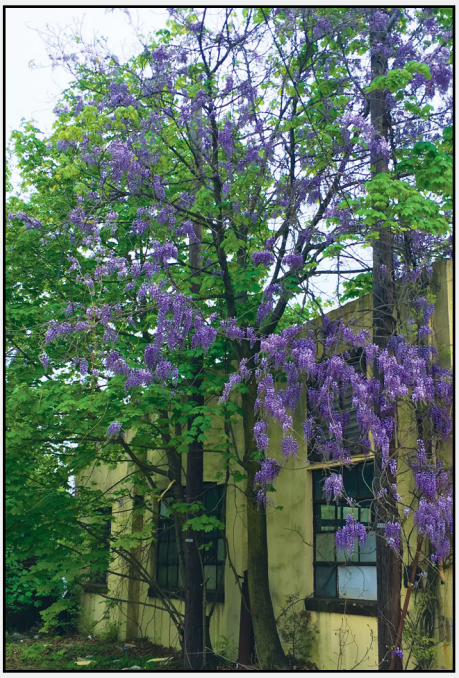


*Figure 2: Wisteria floribunda (*Invasive wisteria), a widespread invasive vine, overtaking a tree.*

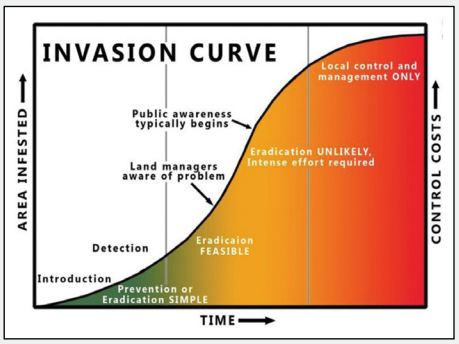


*Figure 3: This invasion curve demonstrates that infestation and control costs are minimal the earlier a species is detected. Source: **mipn.org/edrr**.*

Figure 4: An old field dominated by Pyrus calleryana (Callery or Bradford pear), a popular ornamental tree.

How Can You Start Removing and Replacing Invasive Plants?

If the decision is made to remove invasive plants in a yard, it is important to plan for species replacements.

- Start by making an inventory of the current species and research which are invasive (see below for resources). Determine best removal methods and best timing for species removal. Removal and replacements can happen in stages.
- Manual or mechanical removal is recommended for small populations when the entire plant, including the root, can be removed, or when an area can be repeatedly cut/mowed to remove re-sprouts and deplete the plant's resources.
- If using herbicides to remove invasives, make sure to follow the directions on the label to determine if it is appropriate for the target plant. An excellent method for treating woody invasive plants (vines, shrubs, or trees) is to cut the plant at the base and then treat the remaining stump to prevent re-sprouts. A paintbrush can be used to apply the herbicide directly to the stump. This "cut-stump" method minimizes the use of herbicides and directly targets the invasive plant.
- Since many invasive plants are prolific seed producers, it will be necessary to monitor the area and remove seedlings until the seed bank is exhausted.

When choosing plant replacements, remember to select the right plant for the right place. Choose native species that are appropriate for your local site, including light conditions and soil type. Tables 1-4 on pg 4 provide some of this information.

How Can I Learn More about This Issue?

How can an individual make decisions about invasive plants? Knowing whether the plant is invasive in the region is the first step. In addition to contacting your local Extension office, a few reliable resources are below:

Plant Invaders of the Mid-Atlantic Natural Areas is a field guide for both novice and expert. It is available online and provides information on 92 aquatic and terrestrial invasive species, control methods, effects of climate change, explanations and maps of ecoregions and physiographic provinces, and suggestions for native plant alternatives.

EDDMapS (Early Detection Distribution Map System) is a web-based mapping system for documenting invasive species and pest distribution. It includes species information and distribution maps, and was developed by the Center for Invasive Species and Ecosystem Health at the University of Georgia. An app is available for mobile phones.

USDA PLANTS Database provides standardized information about the vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories. It includes names, plant symbols, checklists, distributional data, and species abstracts, and identifies those states that list any species included on their invasive species list or law.

The New Jersey Invasive Species Strike Team monitors emerging species and works cooperatively with state agencies and local environmental groups to list invasive species in the state as well as control recommendations.

The New Jersey Native Plant Society is a statewide non-profit dedicated to the appreciation, protection, and study of the native flora of New Jersey. Its website has valuable information about native species and where they can be purchased.

iNaturalist is one of the world's most popular nature apps that can be used on a mobile device or computer. It is a tool anyone can use for identifying, recording, and sharing information about plants and other species around the world.

Figure 5: Cut stumps showing painted on herbicide treatment. Cut stump as close to the ground as possible. For larger trees, concentrate the herbicide just inside the bark where the living tissue will carry the herbicide to the roots.

Invasive Ornamental Plants and Suggested Native Replacements

The following lists include both emerging species of concern and widespread invasive plants. The lists were generated based on local state bans, the USDA 2018 report: "New Invaders of the Northeast and Northcentral United States," the Mt. Cuba Center 2017 report: "Native and Invasive Plants Sold by the Mid-Atlantic Nursery Industry," and data gathered by the New Jersey Invasive Species Strike Team (NJISST). Suggested native replacements were determined based on similar characteristics and habitat preferences.

Table 1. Trees

Unless noted, these species invade open, upland habitat such as old fields, roadsides, and forest edges:

- Callery pear (*Pyrus calleryana*)
- Mimosa or Silk tree (*Albizia julibrissin*) Invades wet and dry sites.
- Norway maple (*Acer platanoides*) Invades shady as well as open habitats.
- Palmate maple (*Acer palmatum*)

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Chestnut oak *(Quercus montana)*	Spring	Dry to average	Full sun to part shade	60–70 ft.	Drought tolerant. Wildlife friendly. Good shade tree and street tree.
	Common Serviceberry or Shadbush *(Amelanchier arborea)*	Spring	Dry to moist	Full sun to part shade	20-25 ft.	Large shrub or small tree. Good as specimen tree or hedge. Deer resistant.
	Ironwood or American hornbeam *(Carpinus caroliniana)*	Spring	Dry to moist	Part shade to shade	20–30 ft.	Good small specimen tree. Deer resistant.

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Red Chokeberry *(Photinia pyrifolia, formerly Aronia arbutifolia)*	Spring	Dry to moist	Full sun to part shade	6–8 ft.	Large shrub. White/ pink blooms. Red fall color. Deer resistant.
	Red maple *(Acer rubrum)*	Spring	Dry to moist	Full sun to part shade	40–70 ft.	Good specimen tree. Small red flowers. Orange-red fall foliage.
	Sassafras *(Sassafras albidum)*	Spring	Dry to average	Full sun to part shade	30-60 ft.	Orange to red brilliant fall foliage. Deer resistant.
	Swamp white oak *(Quercus bicolor)*	Spring	Moist to wet	Full sun to part shade	50–60 ft.	Very adaptable. Tolerates wet soil but also drought tolerant. Wildlife friendly. Good for urban environments.

Table 2. Shrubs

Invades open upland habitats:

- Butterfly bush (*Buddleja davidii*)

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Butterfly weed *(Asclepias tuberosa)*	Summer	Dry	Full sun	2–3 ft.	Orange flowers. Host to monarch caterpillars. Deer resistant.
	Buttonbush *(Cephalanthus occidentalis)*	Summer	Wet to average	Full sun to part shade	6-10 ft.	Round white blooms. Good by downspouts or in rain gardens.
	Purple Joe-Pye Weed *(Eutrochium purpureum)*	Summer	Moist to average	Full sun to part shade	5–7 ft.	Large pink flowers. Deer resistant.
	Summersweet or Sweet pepperbush *(Clethra alnifolia)*	Summer	Dry to moist	Full sun to shade	4–8 ft.	Fragrant summer flowers. Blooms in shade. Good for pollinators and wildlife.

These species invade forests and other habitats as they tolerate both deep shade and sun:

- California privet (*Ligustrum ovalifolium*)
- Common buckthorn (*Rhamnus cathartica*)
- European privet (*Ligustrum vulgare*)
- Glossy buckthorn (*Frangula alnus*) Note: Invades open wetlands
- *Invasive barberry (*Berberis thunbergii*)
- Jetbead (*Rhodotypos scandens*)
- Linden viburnum (*Viburnum dilatatum*)
- Siebold's arrowood or Siebold's viburnum (*Viburnum sieboldii*)
- Winged burning bush (*Euonymus alatus*)

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Blackhaw viburnum *(Viburnum prunifolium)*	Spring	Dry	Full sun to part shade	12–15 ft.	Large white blooms. Good for hedges.
	Highbush blueberry *(Vaccinium corymbosum)*	Spring	Acid, dry	Full sun to part shade	6-12 ft	Red fall color. Edible fruit.
	Inkberry holly *(Ilex glabra)*	Spring	Acid, moist to average	Full sun to part shade	4–8 ft.	Evergreen. Good for foundations and hedges. Deer resistant.
	Northern bayberry *(Morella pensylvanica, formerly Myrica pensylvanica)*	Spring	Dry	Full sun to part shade	5–8 ft.	Semi-evergreen. Good for hedges. Salt tolerant. Deer resistant.
	Shining sumac *(Rhus copallinum)*	Summer	Sun	Full sun	10–15 ft.	Red fall color. Small tree.

Table 2. Shrubs *(continuted)*

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Smooth Hydrangea *(Hydrangea arborescens)*	Spring early summer	Dry to average	Part shade to shade	3–6 ft.	Large white blooms on new wood.
	Spicebush *(Lindera benzoin)*	Spring early summer	Moist to average	Full sun to part shade	8-12 ft.	Yellow fall color. Leaves have lemony scent when crushed.
	Virginia sweetspire *(Itea virginica)*	Spring early summer	Moist to average	Full sun to part shade	3–6 ft.	Long lasting red fall color. Deer resistant.
	Witch hazel *(Hamamelis virginiana)*	Fall	Dry	Part sun to shade	15–20 ft.	Yellow flowers. Gold fall color. Deer resistant.
	Winterberry holly (Ilex verticillata)	Summer	Acid, moist to average	Full sun to part shade	6–10 ft.	Red berries in the fall and winter but need male and female.

Table 3. Grasses

These species invade open upland habitat such as roadsides, and forest edges:

- Silvergrass (*Miscanthus sinensis*)
- Weeping lovegrass (*Eragrostis curvula*)

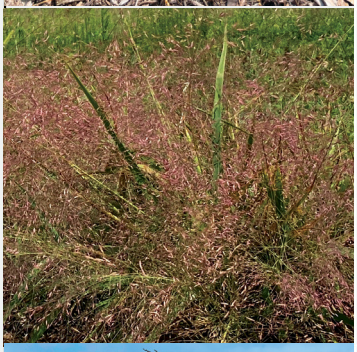
Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Big bluestem *(Andropogon gerardi)*	Summer	Dry to average	Full sun to part shade	4–8 ft.	Drought tolerant. Good for erosion control. Deer resistant.
	Little bluestem *(Schizachyrium scoparium)*	Summer	Dry to moist	Full sun	2-3 ft	Drought tolerant. Good for erosion control. Deer resistant.
	Purple lovegrass *(Eragrostis spectablis)*	Summer	Dry to average	Full sun	1–2 ft.	Drought tolerant. Purple blooms. Good lawn alternative. Deer resistant.
	Switchgrass *(Panicum virgatum)*	Late summer to fall	Dry to moist	Full sun	2–5 ft.	Salt and drought tolerant. Good as a screen. Deer resistant.

Table 4. Vines and Groundcovers

These species invade forested habitats strangling and smothering shrubs and trees:

- Chocolate vine (*Akebia quinata*)
- English ivy (*Hedera helix*)
- *Invasive clematis (*Clematis terniflora*)
- *Invasive honeysuckle (*Lonicera japonica*)
- *Invasive wisterias (*Wisteria sinensis* and *Wisteria floribunda*)

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	American wisteria *(Wisteria frutescens)*	Spring to Summer	Dry	Full Sun	10–30 ft.	Note that this species is native south of Maryland. Large purple blooms. Good for arbors or fences.
	Trumpet or *Coral honeysuckle (Lonicera sempervirens)*	Spring to Summer	Dry	Full sun to part shade	10-15 ft.	Good for arbors or a fence.
GROUNDCOVERS						
	Bearberry *(Arctostaphylos uva-ursi)*	Spring to Summer	Dry	Full sun to part shade	0.5–1 ft.	Evergreen. Red berries. Deer resistant.
	Creeping sedge *(Carex laxiculmis)*	Spring	Average to moist	Part sun to shade	0.5–1 ft.	Clumping and compact. Good groundcover and lawn alternative. Deer resistant.

Native Species Alternatives	Name	Bloom Time	Preferred Soil Type	Preferred Light Conditions	Height	Comments
	Golden ragwort *(Packera aurea)*	Spring	Full sun to shade	Part sun to shade	0.5–2 ft.	Evergreen. Yellow blooms. Deer resistant.
	Pennsylvania sedge *(Carex pensylvanica)*	Summer	Dry	Part sun to shade	0.3–1 ft.	Clump forming, grass-like sedge. Good groundcover and lawn alternative. Deer resistant.
	Wild ginger *(Asarum canadense)*	Spring	Dry to average	Part sun to shade	0.5–1 ft.	Brown/purple blooms hidden under leaves. Spreads by rhizomes.

References

- Coombs, G., Gilchrist D. Watson, P. 2017. ***Native and Invasive Plants Sold by the Mid-Atlantic Nursery Industry*** (PDF). Mt. Cuba Center. Updated 2018.
- Executive Order 13112 of Feb 3, 1999. Invasive Species. Executive Office of the President. Document number 99-3184, citation 64 FR 6183. Pgs.6183-6186.
- Jersey Friendly Yards. 2015. "***Jersey Friendly Yards Plant Data base***" Accessed December 20, 2022.
- Lower, El and Sturtevant Rochelle 2022. ***Alien Language: What's In A (Species) Name?*** Michigan Sea Grant; Michigan State University Extension.
- Leopold, Donald. 2005. Native Plants of the Northeast: A Guide for Gardening and Conservation. Timber Press, Inc.
- New Jersey Department of Environmental Protection, Division of Science and Research. 2019. Wildlife Populations: ***White-tailed Deer, Page 3, Environmental Trends Report***.
- Rawlins, K.A., R.L. Winston, C.T. Bargeron, D.J. Moorhead, and R. Carroll. 2018. ***New Invaders of the Northeast and Northcentral United States*** (PDF). USDA Forest Service, Forest Health Assessment and Applied Sciences Team, Morgantown, West Virginia. FHTET-2017-04.
- Snyder, David and Kaufman, Sylvan R. 2004. ***An overview of nonindigenous plant species in New Jersey. New Jersey*** Department of Environmental Protection, Division of Parks and Forestry, Office of Natural Lands Management, Natural Heritage Program, Trenton, NJ. 107 pages.
- Swearingen, J.M. and J.P. Fulton. 2022. ***Plant Invaders of Mid-Atlantic Natural Areas, Field Guide***. Passiflora Press. 200 pp.
- USDA, NRCS. 2023. ***The PLANTS Database*** (01/03/2023). National Plant Data Team, Greensboro, NC, USA.
- Pinto, D. and Melendez, M. 2010. ***FS1140 Incorporating Native Plants in Your Residential Landscape***. Rutgers Cooperative Extension Fact Sheet FS1140.

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