

This zine is a part of the Urban Ecology Library, hosted at Green Oasis Community Garden in the East Village. This collection explores the city as a multi-species community. How can we work together to create a livable world for all?

The Urban Ecology Library is a project of the Urban Ecology Collective. To learn more, visit urbanecologycollective.org.



INVASIVE PLANTS OF NYC



*The human choices harming our
ecological communities*

Invasive species mentioned

Trees

Norway maple (*Acer platanoides*)

e.g. NYC street trees, Inwood Hill Park

Tree-of-heaven (*Ailanthus altissima*)

e.g. Tompkins Square Park, Van Cortlandt Park

Vines

Porcelainberry (*Ampelopsis glandulosa*)

e.g. Central Park, Forest Park

Asian bittersweet (*Celastrus orbiculatus*)

e.g. New York Botanical Garden, Inwood Hill Park

English ivy (*Hedera helix*)

e.g. storefront decor, Prospect Park

Shrubs

Japanese barberry (*Berberis thunbergii*)

e.g. private gardens, Eastern Catskills

Multiflora rose (*Rosa multiflora*)

e.g. Brooklyn Botanic Garden, Kissena Park

Herbaceous

Common reed (*Phragmites australis*)

e.g. Marine Park, Freshkills Park

Mugwort (*Artemisia vulgaris*)

e.g. edges of roads, Gowanus Canal

Japanese knotweed (*Reynoutria japonica*)

e.g. Bronx River Greenway, Calvert Vaux Park

Visit lhprism.org and nyis.info for regional info about invasive species. Be sure to research accurate ID, including native lookalikes, and best removal strategies.

More resources

Quickly ID plants with apps like Plant.net and iNaturalist (take with a grain of salt). Search up locations of plant sightings on iNaturalist too.

The Forever Wild program and *Wild NYC* by Ryan Mandelbaum catalog NYC natural areas. The NYC Parks Native Species Planting Guide lists native plants. To see the ecosystem that existed in your neighborhood before European colonization, check out welikia.org.

For more about plant adaptations favored in cities, read *Concrete Botany* (Ch. 3) by Joey Santore. For more about ecological landscape design, read *Planting in a Post-Wild World* by Thomas Rainier and Claudia West. For more about why biodiversity and native plants matter, read *Bringing Nature Home* by Douglas Tallamy. For more about indigenous stewardship, read *Braiding Sweetgrass* by Robin Wall Kimmerer.



Systemic factors

The Anthropocene, an era of human domination over nature, has not ushered in flourishing for all, but rather has created apocalyptic scenarios from polluted waterways to climate change. Typical American urban development practices displace entire ecosystems while drastically expanding favorable conditions for a very narrow range of species, such as rats and pigeons, or mugwort and phragmites.

By growing gardens full of "pest-free" non-natives, building roads that fragment forests, and underfunding our parks, we're collapsing the ecosystems that protect us from floods and filter our tap water, all while creating high-disturbance built environments favoring invasives.

Yet, from the oak-tulip forests of Inwood Hill Park to the tidal wetlands of Jamaica Bay Wildlife Refuge, the remnants of native biodiversity are still astonishing. We're protecting these areas and cleaning up rivers so that beavers and dolphins can return to their homes. We're restoring our saltmarshes and building sidewalk rain gardens so that native plants can thrive, and subway stations do not flood.

How can New Yorkers figure out how to live differently on the land with our multi-species neighbors? We can start by learning from the structure of thriving plant communities, and designing for ecological function by default. This means choosing native plants, welcoming insects and decomposers, and reimagining the role humans play in our ecosystem. Every street tree, community garden, and park counts.

Why do plants become invasive?

The land we now know as New York was once forests and wetlands, a rich ecosystem enhanced by human stewardship. These ecological communities lived in geographic isolation from other continents. Indigenous plants and animals developed the co-evolutionary relationships that foster biodiversity, like pollination, competition, predation, and parasitism.

Much has changed since the Columbian Exchange, a mere blip within evolutionary time. Policymakers and the horticultural industry imported plants en masse from all over the world. Kudzu ("the vine that ate the South") was used for erosion control during the Dust Bowl.

These plants escaped human cultivation and reproduced independently, but had not developed the relationships that would allow existing ecosystems to thrive alongside them. They generally could not be eaten by local insects and deer, were not subject to local diseases. They began to outcompete indigenous species, which is what is meant by "invasive."

Today, the industry continues to mass import non-native plants for ornamental and industrial purposes. Largely due to invasive species and habitat destruction, since the 1850s, nearly 50% of native herbaceous species have become locally extinct in NYC.

Plastic fruit in a fruit bowl

Plants are the lowest trophic level, passing the sun's energy up the food chain. Most insects are specialists, evolved to eat only certain plant species (e.g., monarch caterpillars only eat milkweed). Whereas white oak trees support over 400 species of caterpillar, ginkgo only supports 5. Most native bees are also specialists with life cycles synced to bloom times of specific plants.

Invasives have a competitive advantage because they are not food for insects, but that means they don't substitute ecologically for the native species they outcompete. When insect populations decline, so too do bird populations (baby birds require insects, not berries or seeds, for survival). What happens when habitats fill up with greenery that can't support wildlife? Our parks and forests become like plastic fruit in a fruit bowl, providing the aesthetics of "nature" but none of the nutrition. In the United States, 20% of the butterfly species are at risk of extinction, and 25% of the bird population has vanished during our lifetime.



Managing invasive plants

Partnerships for Regional Invasive Species Management, or PRISM, coordinates monitoring and response to current and emerging invasive species. They have developed a tier system to categorize how entrenched a species is within a particular region. There is a different management strategy for each tier.

For known invasives that haven't yet been introduced to the region, PRISM tries to prevent them from entering. For those that have arrived but are not yet abundant, the goal shifts to eradication or containment. And for widespread species, the focus is on local control.

New York state has outlawed the sale of some ornamental invasives, but the law can't solve the problem entirely. Once sufficient harm occurs to galvanize legislation, a species has usually become too widespread to eradicate.

Volunteers needed to preserve our habitats

Mechanical removal (removing species by hand instead of with chemicals) is a typical tactic for managing invasive species. This is because herbicides can have negative effects like contaminating water sources or hurting other plants and animals. The Parks Department, Friends of... parks organizations, and environmental nonprofits like Natural Areas Conservancy and New York Restoration Project all organize volunteer days for invasive species removal. Much of this work is constantly ongoing to keep our parks and forests standing.

Herbaceous plants

Common reed (*Phragmites australis*) is found in wetlands. The filling-in of saltmarshes throughout the 1900s, including as part of Robert Moses's development projects, disrupted the tidal flooding that native cordgrass prefers, and allowed phragmites to spread. Phragmites forms dense colonies that consume lots of water, transforming the local hydrology and reducing habitat for fish and amphibians.

Mugwort is found in human-disturbed areas (e.g., roadsides) and forest edges. It has an extensive system of rhizomes (modified plant stems that send out roots), allowing it to spread aggressively, especially in sunny areas.

Japanese knotweed evolved strong roots and brittle rhizomes to thrive on volcano slopes as well as waterways, where rhizome fragments split off and are dispersed by lava flows and floods. In urban areas, its roots are strong enough to break concrete.



Mugwort (*Artemisia vulgaris*). The leaf underside is covered with white, silvery hairs.



The bamboo-like stems of Japanese knotweed (*Reynoutria japonica*).

Trees

Fast-growing trees that are tolerant of poor soils might seem to make for perfect street trees, but they are also ideal traits for invasive species.

Both tree-of-heaven and Norway maple were introduced as ornamental plants. Non-native trees were especially planted as street trees after Dutch elm disease devastated the population of American elms.

Tree-of-heaven is allelopathic, releasing chemicals stopping other plants from growing nearby. It can resprout from root fragments after being cut, and it is one of the preferred hosts of spotted lanternflies. Norway maple's unusually dense foliage shades out understory plants like native tree seedlings. Both produce massive amounts of seeds that spread by wind using paper-thin wings called samaras, allowing them to easily escape from human cultivation.



Smooth edges and a notched base distinguish the tree-of-heaven (*Ailanthus altissima*) from native species with compound leaflets.



Break open the stem to see milky sap distinguishing Norway maple (*Acer platanoides*) from the native sugar maple.

Vines

Unlike native vines like Virginia creeper and poison ivy, vines like porcelainberry, Asian bittersweet, and English ivy (all introduced for ornamental landscaping) threaten our forests. Birds eat their berries and disperse seeds through droppings, sometimes hundreds of miles away.

Some vines kill trees by girdling them, wrapping around the trunk and cutting off the tree's vascular system. Those that don't still compete with trees for sunlight and can add too much weight. Invasive vines also hurt the understory, carpeting forest floors and out-competing native tree seedlings.

Vines succeed most at forest edges where the canopy is less dense and more sunlight reaches the forest floor. In cities, patches of canopy are so fragmented that they often function as forest edges.



English ivy (*Hedera helix*) carpeting forest floor.



Porcelainberry (*Ampelopsis glandulosa*) leaf shapes vary.



Asian bittersweet (*Celastrus orbiculatus*) smothering a tree.

Shrubs

Invasive shrubs grow dense thickets that crowd out native shrubs, impacting nesting and nutrition for birds.

Japanese barberry is widely used in ornamental landscaping for its bright red fall foliage. Its sharp thorns make it resistant to deer browse, increasing pressure on native species.

Multiflora rose was introduced as rootstock for grafting ornamental roses. It proliferated when the US Department of Agriculture planted it as hedges for containing livestock. It leafs out earlier in the spring and loses its leaves later in the fall, helping it to out-compete native shrubs.



Japanese barberry (*Berberis thunbergii*) has many cultivars in different colors sold in garden stores.



Multiflora rose (*Rosa multiflora*) can be distinguished from native roses by its backwards curving "cat's claw" thorns.