The New York State Native Plants Program

WORKSHOP IN APPLIED EARTH SYSTEMS MANAGEMENT

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Image by Iftikhar Alam

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Executive Summary

New York State faces extensive threats to its ecosystems and native vegetation, such as ecosystem degradation and habitat loss, the rise of invasive species, and growing climate vulnerability. These threats will degrade the ecological, public, and economic health of the state. The New York State Senate has introduced a bill to address these by creating the New York native plants program, which establishes an official plant list, mandates what can be planted in greenspaces and other public lands using state funding, economic incentives through the form of rebates, and educational initiatives and public awareness campaigns. There is a broad scientific foundation underlying the program, encompassing both an understanding of the ecological threats faced across the state and in the range of proposed solutions. These solutions follow principles concerning plant adaptation and ecoregion matching, habitat quality and food-web support, invasive species management, and water management and input reduction.

The program's cost, which is not detailed in the bill or explored here, will be offset by numerous ecological, climate, and social benefits, as well as reduced costs in the long-term. Controversies surrounding the program include the effects of future shifts in climate, the tension between managing plants based on their origin versus their ecological function, and differing attitudes about aesthetic and ecological values, all of which could pose challenges for successful implementation. Once implemented, the success of the program could ultimately be evaluated through the consideration of five scientific indicators: the extent of planting native species in greenspaces; the changing composition of plant communities; habitat quality and food-web support; invasive species dynamics; and soil, water, and chemical inputs. Success could also be measured by two social indicators: market response and public engagement. The program's strong scientific basis and comprehensive policy framework provide a favorable approach for restoring New York's native ecosystems while improving long-term ecological resilience, biodiversity, and public environmental stewardship.

Acknowledgements

Manager
Mariana Zepeda

Deputy Manager
Iyania Corbett

Team Members
Emma Behr
Daicy Dai
Kara Hu
Alex Wang
Tianhao Zhou

Faculty Advisor
Dr. Matthew Palmer



Image by USDA



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ISSUE AND BACKGROUND



Image by NYS Thruway Authority

The native ecosystems, and especially the native vegetation, of New York State (NYS) are facing extensive threats, including habitat loss, the rise of invasive species, and growing climate vulnerability (NYSDEC, 2025). The decline of native plants reduces vital ecosystem services and has significant implications for the ecological health of the state, extending to public, agricultural, and economic health.

In 2025, NYS Bill S1690 was introduced and sponsored by Senator Rachel May of the 48th State Senate District, identifying these threats and reinforcing the government's responsibility to conserve the ecological health of the state. The bill seeks to amend the NYS Environmental Conservation Law and establish the New York native plants program to enhance and promote the use of native plants across the state. This program would establish an official plant list, set mandates to use native plantings on public land, create incentives to use native plants on private land, and support educational initiatives. The program is rooted in conservation incentives to meet public needs and reap the benefits of native plants on public health, agricultural efficacy, and economic and recreational activity.

ECOLOGICAL THREATS IN NEW YORK STATE

Ecosystem Degradation and Habitat Loss



Image by Gary Lovett

Ecosystem degradation refers to the decline in the health, function, and biological integrity of natural systems (IPBES, 2019). Healthy ecosystems provide a wide range of ecological services, including providing habitat for wildlife, pollination, water filtration, flood mitigation, carbon storage, soil stabilization, and nutrient cycling (IPBES, 2019). When these ecosystems become degraded, their ability to provide these services is diminished, often resulting in negative consequences for both biodiversity and human communities (IPBES, 2019).

Ecosystem degradation has emerged as a major environmental concern in New York due to increasing influence from urban development, transportation infrastructure, agriculture, land management practices, and the replacement of native vegetation with less ecologically-valuable landscapes, all of which have altered natural habitats and negatively affected native plant communities (NYSDEC, 2025). The ecological condition influences habitat connectivity, the ability to support native biodiversity and food-webs, the spread of invasive species, stormwater management, and the overall ecosystem health across urban, suburban, and rural communities (U.S. Environmental Protection Agency [EPA], 2023).

The protection and restoration of native plant communities has emerged as an important strategy and priority for policymakers and conservation organizations due to the role of native plants in supporting ecosystem function and adapting to environmental stressors (SB1690B, 2025; New York State Department of Environmental Conservation, 2025).

Native plants provide ecological functions that many non-native ornamental species cannot replace. Beyond consequences on individual plant species, native plants form the foundation of local ecosystems and support complex relationships among insects, birds, mammals, fungi, and other microbes. When native plant communities disappear, organisms that evolved alongside them lose critical habitat and resources. Native plants support substantially higher numbers of native insects than introduced species (Tallamy & Shropshire, 2009). These insects, particularly caterpillars, serve as essential food sources for birds and other wildlife (Burghardt et al., 2009). Native oak trees, for example, can support hundreds of species of caterpillars, while many commonly planted non-native ornamentals support only a small fraction of that diversity (Tallamy, 2007). Because nearly all terrestrial bird species rely on insects to feed their young during nesting season, declines in native plants can create cascading ecological impacts throughout food-webs (Burghardt et al., 2009). The abundance of native plant-dominated communities is particularly important at a time when many insect populations are experiencing widespread declines (Wagner et al., 2021).

New York State has roughly 18.6 million acres of forested land (New York State Department of Environmental Conservation, n.d.). From 2001 to 2025, it experienced a loss of approximately 200,000 hectares, or about 1.1 percent of total forest cover. Of this total, about 79,000 hectares occurred within natural forest areas, leading to an estimated release of 3.2 million metric tons (Mt) of carbon dioxide (Global Forest Watch, n.d.). Habitat fragmentation is particularly significant in highly developed regions, where natural areas are often separated by roads, buildings, and other physical infrastructure. As Figure 1 shows, New York's forest land declined dramatically through the 1800s before recovering during the 20th century, although it remains below its earlier extent.

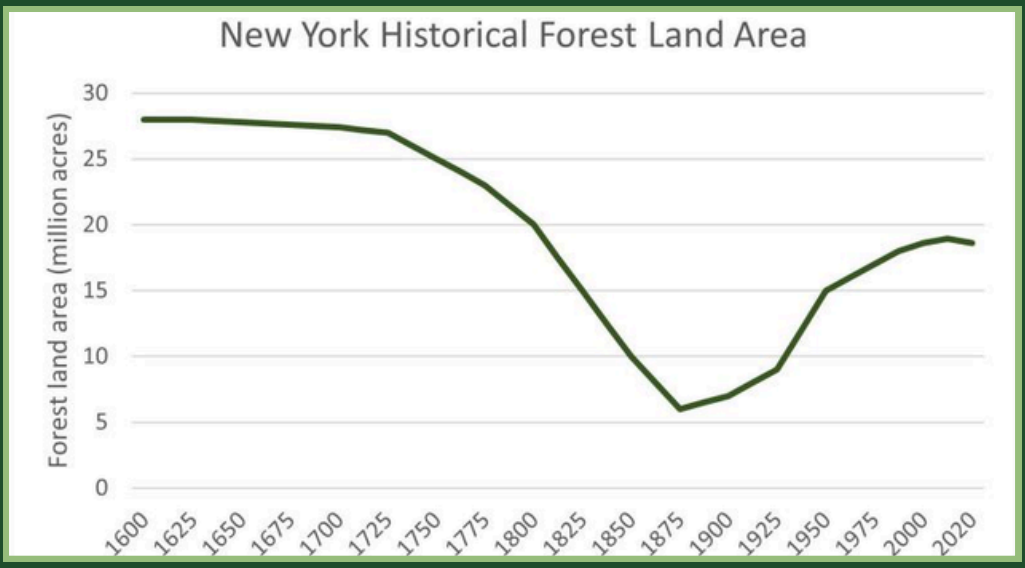

Figure 1: Historical forest land area trends in New York State. Graph from the NYS Department of Environmental Conservation, created using data from SUNY ESF, the Empire State Forest Products Association, and the Forest Inventory Analysis.

Forest degradation extends beyond the loss of forest area. While approximately 62 percent of the state's land area is forest, its forest health is increasingly threatened by invasive pests, pathogens, deer overbrowsing, and climate-related stressors (CAFRI, 2023), all of which reduce the resilience of native plant communities and alter ecosystem processes (CAFRI, 2023; NYSDEC, 2022). Because native tree species provide vital ecosystem services like habitat, food resources, and structural complexity, their decline can reduce habitat quality and produce cascading ecological effects that extend beyond the loss of individual trees (Herms & McCullough, 2014; Tallamy & Shropshire, 2009). One particularly alarming example is the loss of native ash trees across the state.

Decline in Ash Trees

The decline in native ash trees is largely driven by the emerald ash borer, an invasive beetle. Its larvae feed beneath the bark on phloem and cambium, disrupting the transport of water and nutrients throughout the tree (Herms & McCullough, 2014). Once canopy decline becomes visible, most infested trees die within two to four years (Herms & McCullough, 2014). Since its introduction to North America, the insect has killed millions of ash trees and become one of the continent's most destructive invasive forest insects (Herms & McCullough, 2014). In forests near the original invasion area, mortality exceeded 99 percent among ash trees larger than 2.5 cm in diameter (Herms & McCullough, 2014). Figure 2 illustrates both the beetle and the characteristic damage produced as larvae tunnel beneath the bark.

Ash trees account for approximately seven percent of all trees in NYS and are a substantial component of many hardwood forests (Morris et al., 2023). Their loss does more than reduce forest cover. Mortality creates large canopy gaps that increase light availability, alter temperature and moisture conditions, and change understory environments (Herms & McCullough, 2014). These changes can shift forest succession and create favorable conditions for invasive plants to establish and spread, reducing the ability of native species to regenerate (Herms & McCullough, 2014).



Figure 2: The emerald ash borer and its path of destruction. Image by unknown. Public domain via Mary Holland.

Forest degradation also produces cascading ecological effects across multiple trophic levels. At least 282 arthropod species are associated with ash trees in North America, including 43 species that depend exclusively on ash as their host plant (Herms & McCullough, 2014). The loss of ash, therefore, removes critical food and habitat resources for specialized insects and weakens food-web support for birds and other wildlife that rely on these species, changing the composition and ecological interactions of the entire ecosystem.

Lastly, aging and degraded forests are contributing to a declining forest carbon sink, reducing the ability of forests to store carbon and increasing the challenge of meeting New York's long-term climate goals (ESFPA, n.d.; CAFRI, 2023).



Figure 3: Ash trees provide important shade and extreme heat mitigation to New York City. Image by The American Technion Society.





Figures 4 & 5: A healthy ash tree and one directly across the street infected by the Emerald Ash Borer. Images by Michael Orange.

Expansion of Invasive Species



Figure 6: The flowers of a native common milkweed. Image by Anita Gould/Flickr Creative Commons.

Invasive species represent a major ecological and economic threat to New York's ecosystems (NYSDEC, n.d.). Invasive plants can dominate landscapes, displace native vegetation, alter ecosystem processes, and reduce biodiversity (NYSDEC, n.d.). Many established invasive plants were originally introduced through ornamental horticulture and landscaping, including black swallow-wort (*Vincetoxicum nigrum*), mile-a-minute weed (*Persicaria perfoliata*), and water chestnut (*Trapa natans*) (New York Invasive Species Information [NYISI], 2019). Others arrived through different pathways, such as Indian swampweed (*Hygrophila polysperma*), which was introduced through the aquarium industry after unwanted plants were improperly discarded into waterways and ponds (U.S. Fish and Wildlife Service, 2018).

These species are ranked by the New York Natural Heritage Program (n.d.) as "very highly ecologically invasive." Black swallow-wort is particularly problematic because it aggressively overgrows native vegetation (Ramanujan, 2014) and can interfere with monarch reproduction. Monarchs may mistake swallow-wort for native milkweed and lay eggs on it, where their larvae fail to survive (NYISRI, n.d.). Figures 6 and 7 show the visual similarity between native milkweed and black swallow-wort, while Figure 8 illustrates the monarch's ecological dependence on native milkweed.

Figure 7: A Black swallow-wort, similar in appearance to a native milkweed. Image by Jeromy Biazzo/USDA.

Figure 8: Monarch butterfly descending upon a native milkweed plant. Image by Stephanie Knight/Xerces Society.



Invasive species affect agriculture, forestry, tourism, infrastructure, recreation, and ecosystem management. Black swallow-wort vines have reduced land values, damaged Christmas tree farms, and overtaken forests and pastures (Ramanujan, 2014). Farmers and scientists are also concerned that the plant could make livestock sick if it enters hay supplies (Ramanujan, 2014).

Mile-a-minute weed is a major pest in Christmas tree farms, reforestation areas, young forest stands, and landscape nurseries (Ramanujan, 2014). It also commonly invades powerline and utility rights-of-way, increasing management costs for utility companies. Its dense, thorny thickets can deter recreation and reduce the economic and health benefits associated with access to outdoor spaces (New York Invasive Species Information, 2019). Figure 9 illustrates the extent to which mile-a-minute can overtake forest vegetation, creating both ecological damage and costly management challenges.



Figure 9: Mile-a-minute weed overtakes a Long Island forest. Image by Andrew Senesac of Cornell University.

Invasive plant species can alter physical, chemical, and biological ecosystem processes (Mack et al., 2000; Rai, 2022). Some benefit from escaping the herbivores and pathogens that control their populations in their native ranges, while also competing with native species for sunlight, water, and space (Mack et al., 2000). Japanese barberry (*Berberis thunbergii*), a widespread invasive shrub in NYS, illustrates these effects by altering soil conditions, disrupting food-webs, and increasing public health risks (Clark & Seewagen, 2019).

Barberry invasion can alter forest soils in ways that favor non-native earthworms, whose biomass is substantially higher in heavily invaded areas than in adjacent forests (Utz et al., 2023). Their consumption of organic matter can reduce leaf litter by more than 50 percent, degrading habitat for salamanders and ground-nesting birds (Ward et al., 2011). Dense barberry also creates humid forest-floor conditions that favor blacklegged ticks, the primary vector of Lyme disease. Research found substantially higher densities of Lyme-infected ticks in areas with dense barberry than in woodlands without it (Williams et al., 2009; Ward et al., 2011).

Invasive plants can also disrupt food-webs by supporting fewer native herbivorous insects than native vegetation, reducing food available to birds and other wildlife (Tallamy & Shropshire, 2009; Clark & Seewagen, 2019). Figure 10 shows how dense barberry growth can dominate the forest understory and create the altered conditions associated with these ecological and public health effects.

Figure 10: A Japanese barberry infestation in an unidentified forest. Image by unknown. Accessed via Connecticut Gardener webpage. Smaller image by Eugeniya Vlasova/The Spruce.



Climate Resilience

Climate change is increasing environmental pressures across NYS through rising temperatures and changes in the timing and intensity of precipitation that can contribute to flooding or drought stress (United States Global Change Research Program [USGCRP], 2023). The loss of native vegetation and expansion of invasive species can reduce ecosystem resilience to these impacts. Native plants often have extensive root systems that improve soil structure, increase water infiltration, reduce erosion, and stabilize landscapes during storms (EPA, 2023; USDA Natural Resources Conservation Service, n.d.). Figure 11 illustrates how deeper native root systems can provide greater belowground support than many non-native species. The loss of native trees and vegetation can also reduce cooling, stormwater management, and flood reduction benefits (New York City Panel on Climate Change, 2024; EPA, 2023). In urban areas, this is compounded by invasive species such as the emerald ash borer, which has caused millions of tree deaths and billions of dollars in damage and losses (New York State Department of Environmental Conservation, n.d.). Degraded urban canopies can further intensify the urban heat island effect and increase vulnerability to extreme heat.

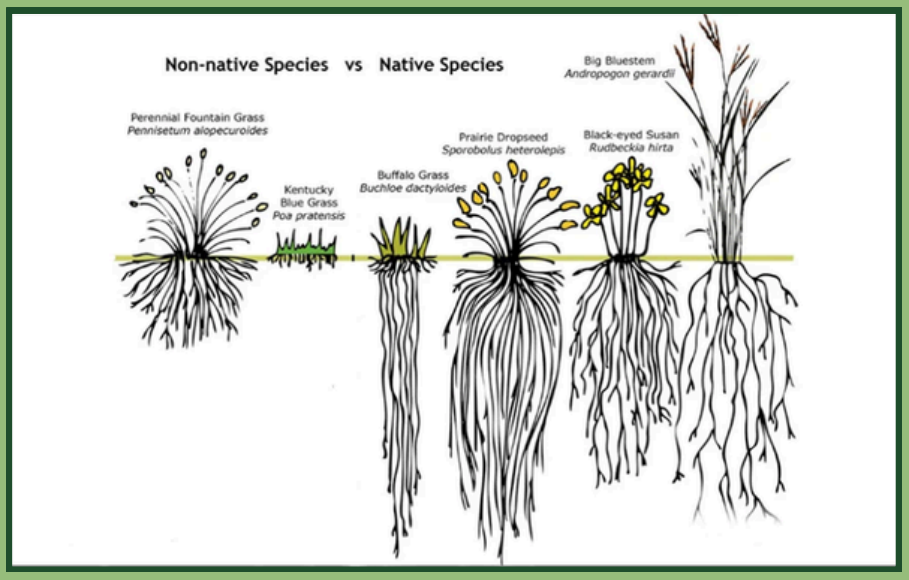

Figure 11: Root system lengths of non-native vs. native species. Graphic by Organic Lawn LLC.

In coastal and riparian areas, healthy native plant communities help stabilize shorelines and streambanks, reducing erosion associated with intense precipitation. Invasive aquatic plants, such as hydrilla (*Hydrilla verticillata*), can form dense mats across lakes, ponds, and slow-moving rivers, interfering with navigation and blocking sunlight needed by native aquatic plants and the fish that depend on them (Dalban, 2024). When hydrilla dies back each fall, decomposing vegetation can deplete dissolved oxygen and harm aquatic life (Dalban, 2024). Hydrilla can also harbor cyanobacteria capable of producing neurotoxins harmful to animals and humans (Dalban, 2024). Warmer fall temperatures and more extreme precipitation can create conditions that favor hydrilla spread, further increasing the vulnerability of aquatic systems (Dalban, 2024).

THE NEW YORK STATE NATIVE PLANTS PROGRAM

Overview

Given the challenges associated with declines of native plant populations in NYS ecosystems, it is urgent to shift public and private efforts to plant more native plants. NYS Senate Bill S1690 addresses this need by proposing the establishment of the “New York State native plants program,” the goal of which is to “encourage and promote the sale of New York native plants and seeds at retail garden centers and nurseries and increase consumer awareness of the important role of native plants in the ecosystem” (SB1690B, 2025).

The legislation authorizes the Commissioner of the Department of Environmental Conservation (DEC) to implement several policy changes, including the establishment of official, ecoregion-specific NYS native plant lists as the foundational tools. Following these lists, the DEC would launch a combination of purchasing and design mandates for state-funded projects, economic incentives for private consumers, and public education partnerships to influence landscaping choices.

Mechanism

Official Plant List

The DEC Commissioner would consult with the Department of Agriculture and Markets and use that department’s statewide native plant list to identify plants appropriate for each New York ecoregion and publish the resulting list. Listed plants would be eligible for the “New York Native Plant” label.

The potential effectiveness of such a strategy is strongly supported by precedents in the neighboring state Connecticut, where the Connecticut Native Plant Availability List (NPAL) shows that official lists can directly drive market behavior. Disseminating this list resulted in over 74 percent of consumers purchasing additional native plants for personal or professional landscaping (Tomis et al., 2025). The list could significantly boost consumer confidence and influence purchasing decisions, allowing consumers to find and choose native plants more easily (Tomis et al., 2025). With the official list implemented by the DEC, NYS is well-positioned to replicate these benefits and translate the scientific benchmarks into increased procurement of species appropriate to the local area.

Mandates

The legislation also dictates the circumstances under which native species must be used on public lands to address varying degrees of ecosystem degradation directly. These mandates target both natural areas (greenspaces) and designed landscapes that are managed, financed, or contracted with the state. The bill also identifies a set of exemptions that provides flexibility.

In Natural Areas (Greenspaces)

The first mandate requires the use of native plants in "greenspaces," defined as state- or municipally-managed public lands designated for recreation, ecological conservation, or scientific study, such as parks and preserves (SB1690B, 2025). The NYS Office of Parks, Recreation and Historic Preservation (OPRHP) manages over 250 state parks and 37 historic sites covering nearly 350,000 acres (NYS Office of the State Comptroller, 2023). With DEC's management of millions of acres of forest preserves and wildlife management areas, this mandate establishes vegetation standards for a large portion of New York's public lands.

In practice, many environmental agencies have already been using native species for ecosystem restoration. For example, the New York City Department of Environmental Protection heavily relies on native plantings to stabilize shorelines and protect water quality in the Catskills watershed (NYCDEP, n.d.). Further, the program would build on prior legislation and programming for the incorporation of native plants in planning, such as the New York City's Local Law 11, passed in 2013, which requires the maximization of native plants in publicly-owned land (New York City Department of Parks and Recreation, n.d.). Therefore, this legislation could codify such existing good ecological practices into state law to ensure that public infrastructure consistently supports native biodiversity.

In Designed Landscapes

The second mandate requires that any site design, construction, and plant selection financed by or contracted with the state must incorporate ecological considerations, specifically prioritizing native plants. This regulation extends the scope of solutions from natural ecosystems to designed landscapes and creates a more stable public-sector market for native plant nurseries.

Enhancing the use of native species in these built environments could directly address climate vulnerability. Traditional ornamental landscapes and lawns require extensive maintenance and large amounts of water, as well as synthetic fertilizers and pesticides (EPA, n.d.). As NYS faces the prospect of hotter summers and increased climate variability, high-maintenance landscapes are becoming increasingly costly. In contrast, native plants have co-evolved with the local climate and soil, making them more naturally drought-resistant, and reducing water and fertilizer needs (EPA, n.d.). The NYC Department of Parks and Recreation has already used this strategy, using native plants in street-level green infrastructure to build climate resilience and manage stormwater runoff (New York City Department of Parks and Recreation, n.d.). This strategy not only enhances climate resilience but also reduces management costs, achieving a win-win outcome.

Exemptions

To accommodate the state's diverse agricultural and structural needs, the program provides several exemptions and maintains flexibility for specific scenarios. Mandates regarding native plants do not apply to community gardens or state-funded agricultural activities dedicated to food production; furthermore, non-native species may be used temporarily as cover crops to assist in establishing native habitats. A subjective exemption also exists, where the Commissioner may authorize the use of non-competitive, non-native plants if it is determined that native plants cannot "adequately fit a certain environment or landscape" . This could lead to potential loopholes, as without strict defined standards for defining which native plants are "unsuitable" for degraded environments, state contractors may utilize the flexibility to bypass mandates and choose non-native plants instead.

Economic Incentives

The legislation proposes a direct economic mechanism to support this market transition: the Commissioner may offer point-of-sale rebates for eligible NYS native plants to remedy the limited supply and often high retail prices for native plants (Wilde et al., 2015). These initiatives are already being implemented in areas of the state, with one example being the 2026 Native Plant Residential Rebate Program by the Town of Hempstead on Long Island. Hempstead collaborated with the Nassau County Soil and Water Conservation District to encourage residents to use native plants in their gardens (Long Island Native Plant Initiative, 2026). With a point-of-sale rebate, the cost difference between native and non-native species could be ameliorated, making native plants more accessible and price-competitive.

Pubic Awareness Campaigns

The bill directs the DEC to increase consumer awareness through advertising, marketing programs, and publicly available information, including eligibility for plants to be labeled as “New York Native Plant” at retail nurseries. This could address consumer ignorance, a key driver of invasive species proliferation, as invasive plants are often fast-growing, resilient, and inexpensive for nurseries to produce (Cronin, 2015), while consumers may be unaware of their ecological consequences (Gagliardi & Brand, 2007). Clear labeling could influence purchasing behavior, as most consumers will choose a native, non-invasive plant over an invasive alternative even at a slightly higher price (Yue et al., 2011).

The bill also encourages partnerships with educational institutions, zoos, botanical gardens, and commercial nurseries to share knowledge about native plant maintenance and propagation. Cornell Cooperative Extension Master Gardener programs have already used demonstration gardens to educate private landowners about transitioning to native landscapes (Cornell CALS, n.d.).

Finally, the legislation requires outdoor demonstration projects in state parks, historic sites, and public university campuses, where intentionally designed, highly visible landscapes can increase public acceptance of ecological landscaping (Nassauer, 1995). Together, these initiatives could encourage greater use of native plants in private landscapes, lawns, and gardens.

Scientific Foundations

Plant Adaptation and Ecoregion Matching

The guiding idea behind the official list of native plants appropriate for each ecoregion is "right plant, right place." A native plant is not automatically successful simply because it is indigenous somewhere in the state. Its survival and ecological value depend on whether it matches local climate, soil, hydrology, light, and disturbance conditions. The NYSDEC explains that native plants are adapted to the local climate and soil conditions where they naturally occur, which is the scientific rationale for selecting plants by site (NYSDEC, n.d.). This explains why the bill's ecoregion-specific list will be more valuable than a single, statewide list. New York spans multiple ecological regions, and a plant suited to one region may perform poorly in another where soil, temperature, rainfall, drainage, or the surrounding plant community differ. Provenance matters for the same reason. The geographic source of a seed or plant influences how it performs, making seed-source decisions consequential for restoration outcomes (Havens et al., 2015). Matching provenance to current and anticipated site conditions is therefore part of the same "right plant, right place" logic that the bill encodes through its provenance and ecoregion provisions.

While the underlying ecological principles behind “right plant, right place” are better established, the bill's forward-looking definition, which includes species likely to shift or expand their range under climate change as NYS natives, raises some challenging management questions. First, the idea that plants will migrate northward with climate change is generally expected but the details of how and how quickly specific plants may migrate are difficult to predict. A systematic review of more than 30,000 range-shift observations found that species are, on average, shifting to higher latitudes and elevations as the climate warms, but with substantial variation across taxonomic groups (Rubenstein et al., 2023). Second, the practical evidence base for which seed sources will be climate-resilient remains thin. A systematic review of provenance-testing studies found that most research has focused on economically important tree species, leaving a shortage of empirical guidance for the herbaceous and shrub species typical of restoration plantings (Vitt et al., 2022). For a decision-maker, the honest framing is that the general principle of matching plants to ecoregion and future climate is sound, while species-specific predictions carry genuine uncertainty.

When plant selection is matched well to ecoregion, provenance, and site conditions, the expected outcomes are higher establishment and survival rates, reduced maintenance needs, and more resilient plantings over time. When selection is done poorly, native plantings may fail or demand more maintenance than anticipated, which is precisely the risk the bill's ecoregion-list and site-analysis provisions are designed to reduce.

Habitat Quality and Food-Web Support

The species composition of vegetation affects habitat quality for other organisms. Turf grass and non-native ornamental plantings may provide visual appeal, but they do not offer the same food-web support as native plant communities. Native plants supply nectar, pollen, and seeds that feed native insects, birds, and other animals, and they support significantly more butterfly, moth, and woody ornamental species than introduced plants (NYSDEC, n.d.; Tallamy & Shropshire, 2009). This matters because butterfly and moth larvae are a foundational food source for birds and other insectivores in terrestrial food-webs. Figure 12 illustrates this relationship, showing how a native oak can support the caterpillars that birds, such as the Carolina chickadee, depend on. The implication for landscaping is direct: an introduced ornamental may look similar to a native plant, but it is unlikely to sustain the same richness of wildlife.

Improving wildlife habitat through native plantings is already codified as a standard conservation activity. The USDA Natural Resources Conservation Service treats pollinator habitat establishment as a planned conservation enhancement. Its planting criteria emphasize native species and require early-, mid-, and late-blooming forbs, legumes, vines, or shrubs, along with documentation and maintenance requirements (USDA NRCS, 2023).

Achieving this improved environmental impact requires a shift from managing primarily for visual appeal to managing for function. When native plants are used in parks, medians, verges, gardens, state parks, and other state-financed landscapes, those areas can serve as functional habitat rather than purely decorative plantings. The expected result is stronger support for insects, birds, and other wildlife, especially where plantings are diverse and provide nectar and pollen across the growing season (NYSDEC, n.d.).



Figure 12: Native oak trees provide critical food-web support. LEFT: A native black oak tree stands tall and strong. Image by Manzers Landscaping. **RIGHT: A Carolina chickadee finds a caterpillar living on a native black oak tree.** Image by Papilio/Alamy of the National Audubon Society.

Managing Risks from Invasive Species


Image by New York City Parks Plant Ecology Center and Nursery.

The bill would reduce invasion pressure indirectly by increasing native plant use and concomitantly decreasing the use of potentially risky non-native ornamentals. By promoting native alternatives through lists, labels, rebates, education, and public use requirements, the bill can reduce one pathway of future invasions: the repeated planting and movement of non-native ornamentals. It may also lower the risk of introducing pests and pathogens since live plants are a major pathway for insect and pathogen invasions (Liebhold et al., 2012).

Ornamental horticulture is a major pathway for introducing non-native plants, and the frequency of species in horticultural trade can be linked to escape from cultivation and spread into unintended habitats (Dehnen-Schmutz & Touza, 2008). This is consistent with the scientific concept of propagule pressure: the more often a plant is sold, transported, or introduced, the higher the risk the plant will establish outside of cultivation. Recent research indicates that propagule pressure from historic U.S. plant sales predicts establishment better than the residence time, which means introduction frequency is a highly reliable predictor of establishment risk (Fertakos & Bradley, 2024). This evidence demonstrates the strong relationship between ornamental horticulture and biological invasion.

However, in the U.S., 61 percent of 1,285 plant species identified as invasive remain available through the plant trade, including 50 percent of state-regulated species and 20 percent of federal noxious weeds (Beaury et al., 2021). With higher market demand for native species supported by rebates, education, and public awareness campaigns, the bill can shift consumer purchasing behavior to shrink the demand for such non-native plants, reducing the risk of future invasions from horticulture. The environmental impact worth emphasizing here is the shift from reactive eradication to proactive prevention. By reducing the propagule pressure from the market, the state can protect local ecosystems and save on management expenses of future invasions.

Reducing Irrigation, Fertilizers, and Pesticides

The use of native plants can increase ecological resilience to climate stressors. In a study of 66 grasslands, introduced species were, on average, 29.5 percent more negatively affected by drought than native species (Frost et al., 2025).

Native plant landscaping can also reduce maintenance requirements. NYSDEC states that, once established, many native plants require minimal irrigation beyond normal rainfall and can reduce the need for water, fertilizer, pesticides, pruning, and other maintenance inputs (NYSDEC, n.d.). In a Connecticut study, six native shrub taxa received limited irrigation, and five achieved third-year aesthetic-quality ratings statistically comparable to Japanese barberry and winged euonymus, both invasive non-native plants (Lubell, 2013). A global grassland experiment likewise found that mineral nutrient addition increased non-native plant abundance while reducing native plants, suggesting that fertilization may be unnecessary for some native meadow or grassland plantings (Seabloom et al., 2015). Reduced pesticide use can also lower the risk of toxins entering soils and local watersheds (NYSDEC, n.d.). Together, these findings suggest that native plants can support more resilient landscapes while requiring fewer inputs and producing fewer negative outputs.

Beyond reducing inputs, vegetated systems that include native plantings can improve green infrastructure performance. These systems collect runoff, promote infiltration, filter pollutants, and provide wildlife habitat (EPA, 2026). Field studies in New York further demonstrate their value for water management. A rain garden in the Bronx retained an average of 78 percent of incoming stormwater and achieved complete retention during rainfall events of less than 10 millimeters (Feldman et al., 2019). In guarded New York City tree pits, groundcover vegetation and mulch also increased infiltration rates (Elliott et al., 2018). Figure 13 shows one example of this kind of system in practice. Although the scientific basis for promoting native plants is strong, translating these principles into statewide policy through the bill still raises several controversies.



Figure 13: A rain garden, or bioswale, in the Bronx. Image by the Bronx Bioswale Watch.

Controversies

Native Plants Range Shifts

Available evidence shows that climate change can alter suitable plant habitat, but the direction and speed of species movement remain uncertain (Fei et al., 2017; Iverson et al., 2008; Zhu et al., 2012). The main controversy is how New York should decide which plants are likely to shift or expand their ranges into the state as the climate changes and the time horizon for anticipated changes that should guide this decision. The legislation defines native plants to include species that are indigenous to New York and likely to remain or adapt under future climate conditions. It also includes non-invasive plants that are likely to shift or expand their ranges into New York. The bill does not specify which models, confidence levels, or time periods the NYDEC should utilize to decide which migrating plants may be considered native at present or in the future.

A strict historical-native approach would prioritize plants and seed sources that are currently or historically found near the planting site. Local ecotypes may possess traits that are suited to regional environmental conditions (USDA NRCS, 2010). A climate-adjusted approach would allow the use of plants or seed sources from warmer regions nearby when scientific evidence suggests they may be better suited to future conditions. This approach may improve long-term resilience but also create risks related to poor establishment, competition, and unexpected ecological impacts (Williams & Dumroese, 2013).

The disagreement is not over whether climate change is altering plant habitat. It concerns the degree to which agencies should respond to projected changes. A cautious historically-native approach gives greater weight to current ranges and locally-adapted plant populations, and avoids uncertainty in modeling future habitat. A climate-adjusted approach gives more weight to future conditions, recognizing the long lifespan of trees and other perennial plants. Supporters of the climate-adjusted approach argue that waiting for range shifts to occur naturally may leave public landscapes poorly adapted to the conditions they will experience in future decades. The level of disagreement is moderate—there is growing support for climate-informed planning, but less agreement about which models, time horizons, and confidence thresholds should determine whether a plant qualifies.

Consensus is likely to increase around the use of multiple models, pilot projects, and ongoing monitoring. Greater disagreement will probably remain over the acceptable level of uncertainty and how far beyond a species' current range the state should look.

Origin vs. Ecological Function

The native plant program uses geographic origin as the main basis for determining which plants should be favored while allowing limited exceptions for other plants. The strongest argument for a policy focused on geographic origin concerns the relationship between plants and herbivorous insects, which supports the transfer of energy through complex food-webs and can influence populations of species, such as the Carolina chickadee (Narango et al., 2018). As many as three-quarters of leaf-eating insects like caterpillars feed on plants within a limited taxonomic group, making them more likely to use plants with which they share a regional evolutionary history than recently introduced ornamentals (Jabr, 2026). Researchers have found lower caterpillar abundance and diversity on non-native plants compared with natives (Burghardt et al., 2010), and a relatively small number of native plant species can support large shares of butterfly and moth species (Jabr, 2026). This does not mean every native plant provides the same ecological value, but the broader pattern gives geographic origin practical value as an indicator of how likely a plant is to support existing local food-web relationships.

The function-first critique questions whether origin alone is enough to determine ecological value, or whether plants should be judged more directly by what they do within a particular ecosystem. Most introduced plants never become invasive and may provide useful functions in altered environments. There have been instances of non-native trees helping forests recover on heavily disturbed land, introduced plants providing shelter or food for wildlife, and butterflies adopting foreign plants as larval hosts (Jabr, 2026). Some non-native flowers can also supply nectar and pollen to native bees (Seitz et al., 2020), which may be especially useful in highly developed landscapes or during seasonal gaps in native flowering. Figure 14 illustrates this point: although the Norway spruce is non-native, it was used in New York's reforestation efforts to help reestablish forest cover on degraded land. From this perspective, geographic origin provides important information about likely ecological relationships, but it does not fully determine ecological function.



Figure 14: Non-native Norway spruce was widely planted on abandoned farmland during New York's twentieth-century reforestation efforts, helping establish forest cover on degraded land. Image by Serg Velusceac.

The non-native butterfly bush and native butterfly milkweed provide a useful illustration because they support different ecological functions. Butterfly bush can attract adult butterflies and other pollinators through consistent nectar production over a relatively long blooming period, which may be especially useful when other floral resources are limited. At the same time, it is generally not a larval host for monarch butterflies and may display invasive or weedy behavior in some regions. Butterfly milkweed provides nectar for a shorter period, but it also gives monarch caterpillars the leaves they need to develop. The two plants may therefore both provide food resources, but they are not ecologically interchangeable. As Figure 15 shows, monarchs can use both plants, but in different ways: butterfly bush mainly supports adult nectar feeding, while milkweed also supports larval development. From this perspective, native status is not simply a preference for historical purity. It can serve as a practical shortcut for identifying plants more likely to support ecological relationships that developed over long periods of time.

Critics of strict native plant policies argue that conservation decisions should place greater emphasis on ecological function than geographic origin. Ecosystems have never been completely static, and climate change and human land use have made historical conditions increasingly difficult to recreate. A non-native plant that provides shade, stabilizes soil, supplies food, or survives difficult urban conditions may therefore still have ecological value.

The central disagreement is less about whether ecological function matters than about how much weight origin should receive relative to other considerations, including invasiveness, habitat function, climate suitability, water demand, maintenance, and human use. Native plant advocates argue that origin remains important because ecological relationships and risks can be difficult to predict in advance. Introduced species may create problems that are not apparent until they have already become widespread, at which point control or removal can be expensive or impossible (Simberloff et al., 2011). The policy question is therefore not simply whether native or non-native plants are inherently better, but whether geographic origin is a useful enough indicator of ecological compatibility to justify giving native species preference.





Figure 15: Monarch butterflies enjoy the resources provided by both the non-native butterfly bush and native milkweed. LEFT: Adult Monarch butterfly consuming nectar from a non-native butterfly bush. Image by unknown. Accessed via Google stock images. **RIGHT: Adult and larval Monarch butterfly supported by a native milkweed.** Image by unknown. Accessed via The Plant Native webpage.

Practical and Aesthetic Needs

Views on native plants are diverse and can be negative, with native species often perceived as less aesthetically pleasing, "proper," or "cared for" than non-native alternatives, reducing their perceived value. This creates pressure for native species to conform to people's ideas of what an attractive landscape should look like (Beck et al., 2002). Their ecological value is also not always obvious to consumers. Plantings with features, such as tall vegetation, may be seen as unfamiliar, overgrown, or "messy, weedy, or unkempt" (Nassauer, 1995), while tidy patterns and maintained edges are more often read as signs of care.

People may support ecological improvement in principle but become less supportive when it conflicts with expectations of a properly maintained landscape (Nassauer, 1995), which are strongly shaped by social norms and assumptions (Peterson et al., 2012). Figure 16 illustrates this tension by contrasting the more naturalistic appearance of a native landscape with the tidier look often associated with conventional non-native plantings. This is despite the fact that some aesthetic practices, such as removing seed heads or dead leaves, reduce ecological function. While native plantings may require fewer inputs like water or fertilizer, they still require care, including site preparation, early weed control, replacement planting, and pruning.

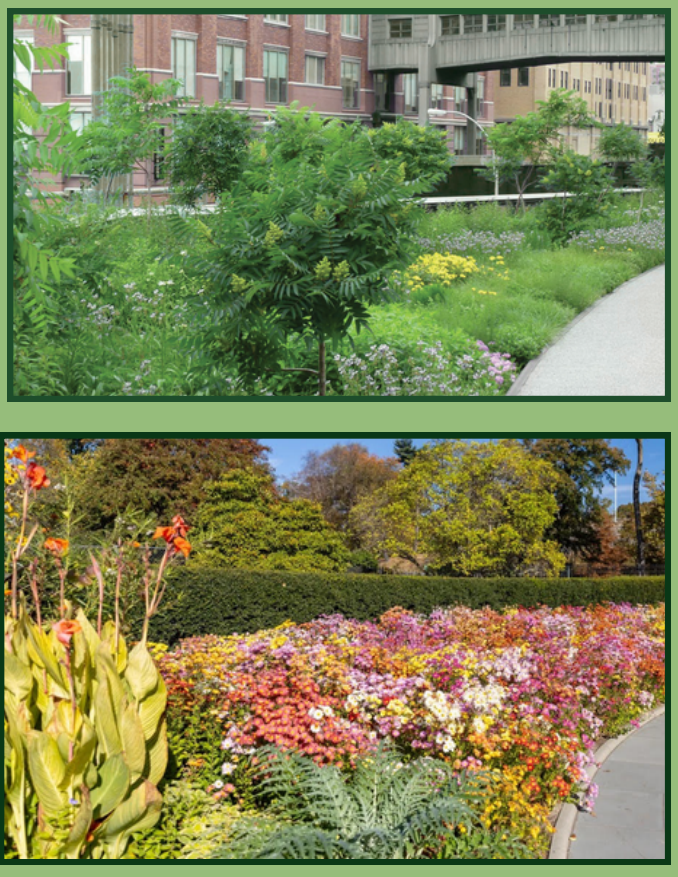

Figure 16: A comparison of the appearance of a native versus a non-native landscape. TOP: Native landscape. Image by unknown. Accessed via The High Line webpage. **BOTTOM: Non-native landscape.** Image by unknown. Accessed via The Central Park Conservancy webpage.

Positive perceptions of both ecological value and attractiveness can be strengthened through the use of climate-adapted, aesthetically appealing native plants in landscape planning, along with educational initiatives. Demonstration projects may help residents become more familiar with native landscapes and understand why they are designed and managed differently (Gillis and Swim, 2020). NYC's High Line, a public park built on an abandoned rail line and managed by both the city and a nonprofit organization (High Line, n.d.), is a strong example. It emphasizes native plants because of their benefits to the local ecosystem, including drought tolerance, reduced maintenance and fertilizer needs, and the provision of food and shelter for many species and pollinators. It attracts millions of visitors each year (Brandt, 2019) and has helped cultivate greater familiarity with native-rich, meadow-like landscapes while increasing public appreciation of their design (Oder, 2017). Figure 17 shows how intentional maintenance and design can make native plantings both visually appealing and publicly popular. The High Line, therefore, demonstrates how ecological design can enhance both aesthetic and ecological value (Nassauer, 1995).



Figure 17: Scenes from the High Line in Manhattan show its prioritiziation of native plants, the care its staff put into its maintenance, and its popularity among tourists and visitors. Images from the High Line.

PROGRAM EVALUATION

Scientific Indicators

Native Planting in Greenspaces

The first scientific indicator tracks the extent to which native plants are being planted in the greenspaces the bill covers. If compliance is low and native plant use is not enforced in practice, the state cannot reasonably expect to observe improvement in any of the downstream ecological indicators. Key metrics include the percent of state-owned and state-contracted greenspaces that use native plant materials in their planting projects and the percent of those greenspaces where the species planted match the approved list for their ecoregion. Data would be drawn from state contracting records and from within-agency records of planting activity. Contracting records will likely need to be modified to certify native plant use and include detailed lists of species.

The difficulties with this indicator include reporting compliance and unreliable or otherwise limited data sources. Tracking based on contract records is only as reliable as its reporting, and weak enforcement would undermine it. While contracted work leaves a clear written record, planting carried out by agency crews may never be documented in comparable forms. A greenspace maintained in-house could, therefore, appear to have no native plantings, even when those plantings are simply unrecorded. NYS would need to enforce standardized reporting formats covering both agency staff and contractors.

Native Plant Establishment and Ecoregion Matching

A second scientific indicator assesses whether the native plants persist. It is possible for plantings to fail; thus, establishment requires measurement at an appropriate interval after planting. The primary mechanism for evaluating long-term project success is monitoring for some combination of diversity, density, and abundance (Dorner, 2002). Data would come from surveys sent to landscape management firms and contractors, together with field monitoring conducted on state lands. Survey protocols would need to be standardized. Field monitoring on state lands exists to some degree, though the state will need to review whether the parameters currently captured are sufficient for this purpose. The state could also request vegetation survey data from other agencies (e.g., federal, county, municipal) and other land managers that may be collecting these data, such as land trusts and other conservation organizations.

The main practical difficulty is scope. Vegetation survey efforts must span across many sites and across several years to adequately assess whether the goals of the program are being met. The second constraint is baselines. The temporal and spatial extent of vegetation surveys are quite variable, so requiring one before any planting could begin could stall the program indefinitely. Change in establishment can be calculated for sites that have pre-planting records, and those sites would form the comparison set for vegetation change. Greenspaces without such records would still be planted but could not be compared to a pre-management baseline.

Habitat Quality and Food-Web Support

A third scientific indicator uses breeding birds as a proxy for whether native plantings are restoring ecological function. Breeding birds occupy high positions in the food-web, so their abundance and richness integrate conditions across several trophic levels at once. DEC itself treats birds as well suited to statewide survey work partly because they are easy to observe, widely identifiable, and serve as indicators of environmental health (NYSDEC, n.d.). Native plants support higher insect biomass, (cont.)

Scientific Indicators

(cont.) and breeding birds depend heavily on insects to rear their young. The key metrics are breeding bird abundance and richness within monitored greenspaces, and optionally the relationship between the proportion of native plants at a site and bird occupancy at that site.

New York already runs a statewide inventory of breeding birds through the Breeding Bird Atlas, which divides the state into blocks of roughly nine square miles and relies on volunteers to record every species using each block and document evidence of breeding (NYSDEC, n.d.). The Atlas gives the state an established methodology and a long comparison record, since the first ran from 1980 to 1985, the second from 2000 to 2005, and the third from 2020 to 2024 (NYSDEC, n.d.). While this inventory offers a good starting point, it cannot serve as the full measure of the program. The Atlas is conducted only once every twenty years, and its survey blocks are much larger than a single greenspace (NYSDEC, n.d.). Site-level point counts will therefore need to be created within appropriate greenspace boundaries, with Atlas data serving as the regional backdrop against which those counts are read. The third Atlas collects its records through eBird, so volunteer observations in New York accumulate on that platform continuously rather than only during Atlas years (NYSDEC, n.d.).

eBird checklists record date, location, and observer effort, which means they can be filtered to greenspace boundaries and used to cover the years between Atlas cycles. iNaturalist enhances data collection further. Since its records are not limited to birds but also include plants and insects, making it useful both for confirming what is growing at a site and for other indicators described below. Still, it must be acknowledged that both platforms carry the limits common to opportunistic data since observers visit convenient and popular locations more often and effort varies between visits. They work best as a supplement that extends coverage between formal surveys, not as a replacement for the site-level point counts described above.

Attribution is the central difficulty. Bird populations respond to vegetation change with a lag and are also shaped by migration patterns and surrounding land use, so results from any single greenspace are hard to interpret on their own. Multi-year data with comparison sites will be necessary before any pattern can be read as being linked to a specific planting project. Threshold effects also matter for how targets are set. Bird populations have been found to be sustained only where non-native plants made up less than roughly thirty percent of plant biomass, which gives the state a usable benchmark rather than an open-ended goal (Narango et al., 2018).

Invasive Species Dynamics

A fourth scientific indicator tracks whether increased native plant use is accompanied by a reduction in the abundance of invasive plants. The key metrics are the abundance and diversity of invasive species within monitored greenspaces. If possible, the state should also compare the abundance of invasive plants in greenspaces that have been planted with native species against those that have not, which produces more interpretable results than a single time series.

Data would come from field surveys conducted by the state, supplemented by research from other agencies and institutions. Much of this infrastructure already exists. The New York Invasive Species Research Institute at Cornell University coordinates a statewide network dedicated to tracking invasive species (New York Invasive Species Research Institute, n.d.). (cont.)

Scientific Indicators

(cont.) The main difficulty is separating correlation from causation. Changes in the abundance of invasive species may result from climate conditions or from changes in external spread pathways rather than the effects of planting natives. Similarly, the arrival or expansion of new invasive species may happen regardless of how many native plantings have occurred. Comparison sites with and without native plantings again offer the most practical way to strengthen the causal inference.

Water, Soil, and Chemical Inputs

A final scientific indicator measures whether the practices described in the bill lead to fewer chemical and water inputs. Native plants can reduce supplemental watering and chemical application while improving infiltration, which can limit runoff carrying fertilizer and pesticides into surface water (NYSDEC, n.d.). Key metrics include water, fertilizer, and pesticide use per unit area of managed greenspace, along with measures such as infiltration rate, runoff volume, and water chemistry. Figure 18 highlights one practical application of these principles through rain garden installation.

Input data could come from maintenance logs and operating budgets of state and municipal land managers, including fertilizer and pesticide purchase records. This makes these outcomes relatively easy to track because much of the administrative data already exists. Soil and water measurements would require new site sampling. Attribution presents the larger challenge because year-to-year rainfall affects irrigation and runoff independently of the program. Rainfall would therefore need to be controlled statistically, or comparison sites exposed to the same weather conditions would be needed before reductions could be attributed to the program.



Figure 18: Stewardship volunteers planting a rain garden in Queens. Image from the New York City Department of Environmental Protection.

Social Indicators

Market Response

The first social indicator seeks to track the effectiveness of the rebates proposed in the bill, designed to shift consumer purchasing behavior towards native plants and increase the use of these plants on privately-owned land. The key metrics to be tracked against this indicator are the number of participating retailers, the percentage of plants sold that are native plants at such retailers, and the annual amount of rebates that is issued to customers. In addition, NYS already requires plant nurseries to be licensed (Department of Agriculture and Markets, n.d.). As a forward-tracking metric, it may be possible to mandate nurseries to list the species of native plants they plan to produce as part of new license registrations or license renewals for such nurseries to aid in tracking the commercial production of native plants. The state will need to issue surveys to retailers across the region and survey how many of them are selling native plants and what proportion of plant purchases comprise of native plants. Lastly, rebate amounts will be automatically tracked once implemented, as per regular state processes when governments issue rebates. Thus, the only two new data collection methods that need to be implemented would be the creation of the survey and adjustments to nursery licenses.

Public Engagement

The second social indicator seeks to understand the level of participation in native plant education programs and changes in public understanding to address how well the education initiatives in the program are effectively communicating with the public. The key metrics to be tracked against this indicator are the number of participants at the education programs and/or public events, changes in public awareness and knowledge, and the number of active public-private partnerships specific to native plants. Each of these components will require a different tracking mechanism. Participants at educational programs will be tracked via attendance records. Changes in public awareness and perception will be tracked via surveys. The number of public-private partnerships will be tracked in an active ledger. The NYS government could potentially survey partners, such as botanical gardens and nature centers, to supplement attendance data with additional measures of engagement.

This could include measures such as number of attendees to native-plant-specific exhibits or programs and post-visit surveys for visitors that include questions regarding the public's sentiment around native plants. Given the amount of time and number of exposures to messaging it will take to shift public awareness, this indicator should be measured quarterly.

Altogether, these indicators serve to effectively evaluate the program's success in the long-term by building on existing tools, though some may incur additional efforts and costs.

CONCLUSION

New York State's native plant program responds to an ecological problem that extends well beyond the loss of individual plant species. Habitat degradation, invasive species, and a changing climate are altering the ecosystems that native vegetation helps sustain. The bill approaches these pressures by changing how plants are selected and purchased across public landscapes while also attempting to influence the private market. Its combination of an ecoregion-specific plant list, public land management requirements, consumer incentives, and education gives the state several ways to increase native plant use rather than relying on a single policy mechanism. The scientific evidence reviewed in this report provides substantial support for that general approach, particularly where native plants strengthen food-webs, reduce opportunities for invasive species, and improve the ecological function of managed landscapes.

At the same time, the evidence does not support treating native status as a simple dividing line between ecologically valuable and ecologically harmful plants. Climate change is already changing species distributions, and some non-native plants can perform useful functions in heavily altered environments. Native plantings can also face resistance when they conflict with familiar expectations about how parks, gardens, and other managed spaces should look. These questions do not undermine the rationale for the program. They show why implementation will matter so much. A native-first approach will be most defensible when plant selection remains responsive to ecoregion and site conditions, ecological function is considered alongside origin, and exceptions are based on demonstrated needs rather than convenience. Careful design and communication will also be important if ecologically valuable landscapes are to become landscapes that New Yorkers understand and want to maintain.

The program's success therefore should not be judged simply by how many native plants are purchased or placed in the ground. It will depend on whether those plants establish successfully, whether the landscapes in which they are used become more ecologically functional, and whether the program begins to change the practices of agencies, nurseries, and the public. The evaluation framework proposed in this report provides a way to distinguish implementation on paper from meaningful change on the ground. Establishing baselines early, improving reporting where existing data are inadequate, and following outcomes over several years would allow the state to adjust the program as conditions and scientific knowledge change.

The native plant program cannot by itself reverse the broader forces degrading NYS's ecosystems. It can, however, change an everyday decision that is repeated across thousands of public projects, nurseries, gardens, and managed landscapes: what gets planted, and why. That makes the program a practical opportunity to incorporate ecological function more deliberately into the landscapes New York continues to build and manage. Its long-term value will depend less on whether every planting is strictly native than on whether the program succeeds in creating healthier landscapes that can continue to support New York's ecosystems as environmental conditions change.



Image: myhomepark.com

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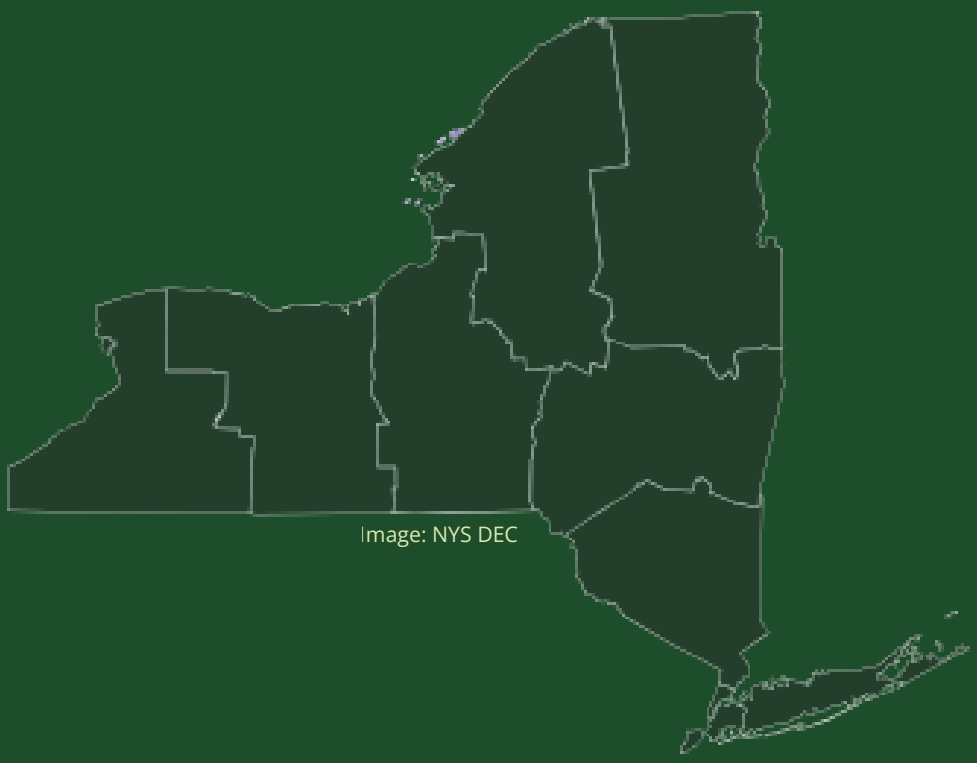

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