The Norwalk MicroForest

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MAY 29th, 2025

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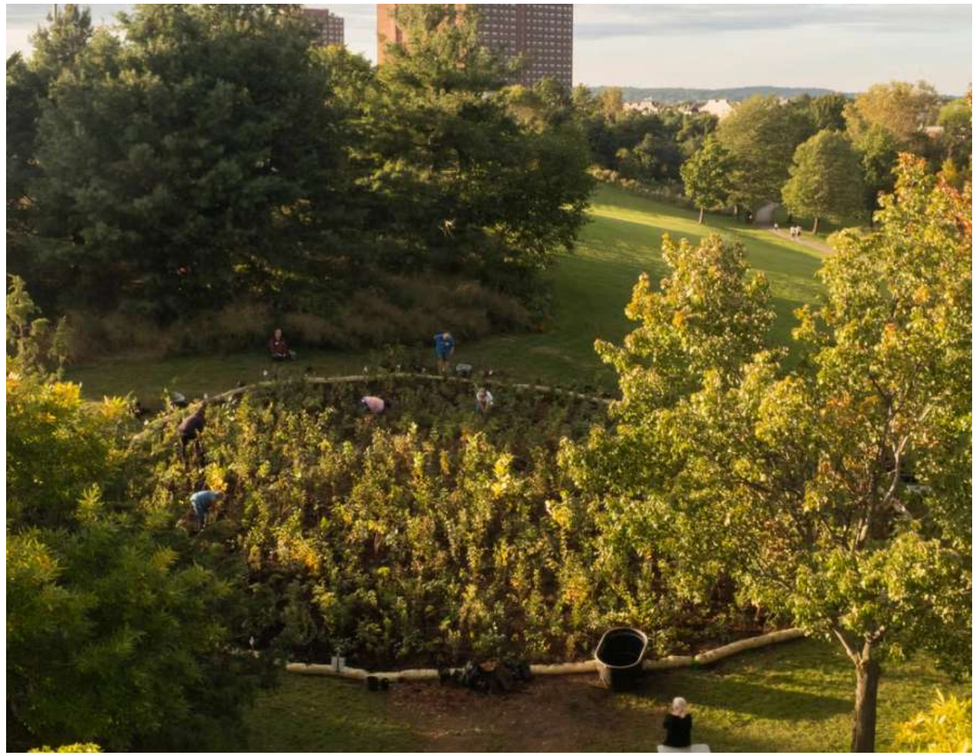
Introduction & Context

This project is located in Norwalk, Connecticut, a coastal city within the Northeastern Coastal Forests ecoregion. An old industrial city, Norwalk's development and urbanization placed increasing pressure on its natural ecosystems, making green infrastructure projects like this MicroForest essential for restoring ecological balance.

Situated within an industrial zone, the MicroForest will provide much-needed green space in a highly developed area, offering both environmental and social benefits. The site is across from a scrap metal recycling plant, down from the soon to be rebuilt Norwalk Housing Authority's Meadow Garden Homes, and two blocks from a school under construction that should open partly in the fall. The investment in the infrastructure of the community is being matched by investment in the MicroForest, which will allow for an increase in environmental health, ecological education, outdoor learning, and hands-on engagement with nature for local students and families. By embedding a thriving forest into the city, this project not only enhances urban resilience but also fosters an appreciation for the natural world, encouraging future generations to value and protect their natural resources.

The MicroForest will derive from oak-hickory forests, coastal maritime forests, and relevant pollinator habitats. The seasonal rhythms of Connecticut's native flora vibrant fall foliage, spring blooms, and summer pollinator activity will offer a dynamic, ever-changing landscape, deepening the community's connection to nature. The MicroForest will improve air quality, reduce urban heat, absorb stormwater, and return local biodiversity. The MicroForest demonstrates that investment in public health, urban resilience, and community well-being is critical, and that Norwalk is setting a precedent for other cities to follow.

Precedents



Cambridge, MA

Roosevelt Island, NY


THE MARGINS
THE GROVE
THE DEEP FOREST
THE CLEARING
THE WOODED MEADOW
WILDFLOWER POCKETS
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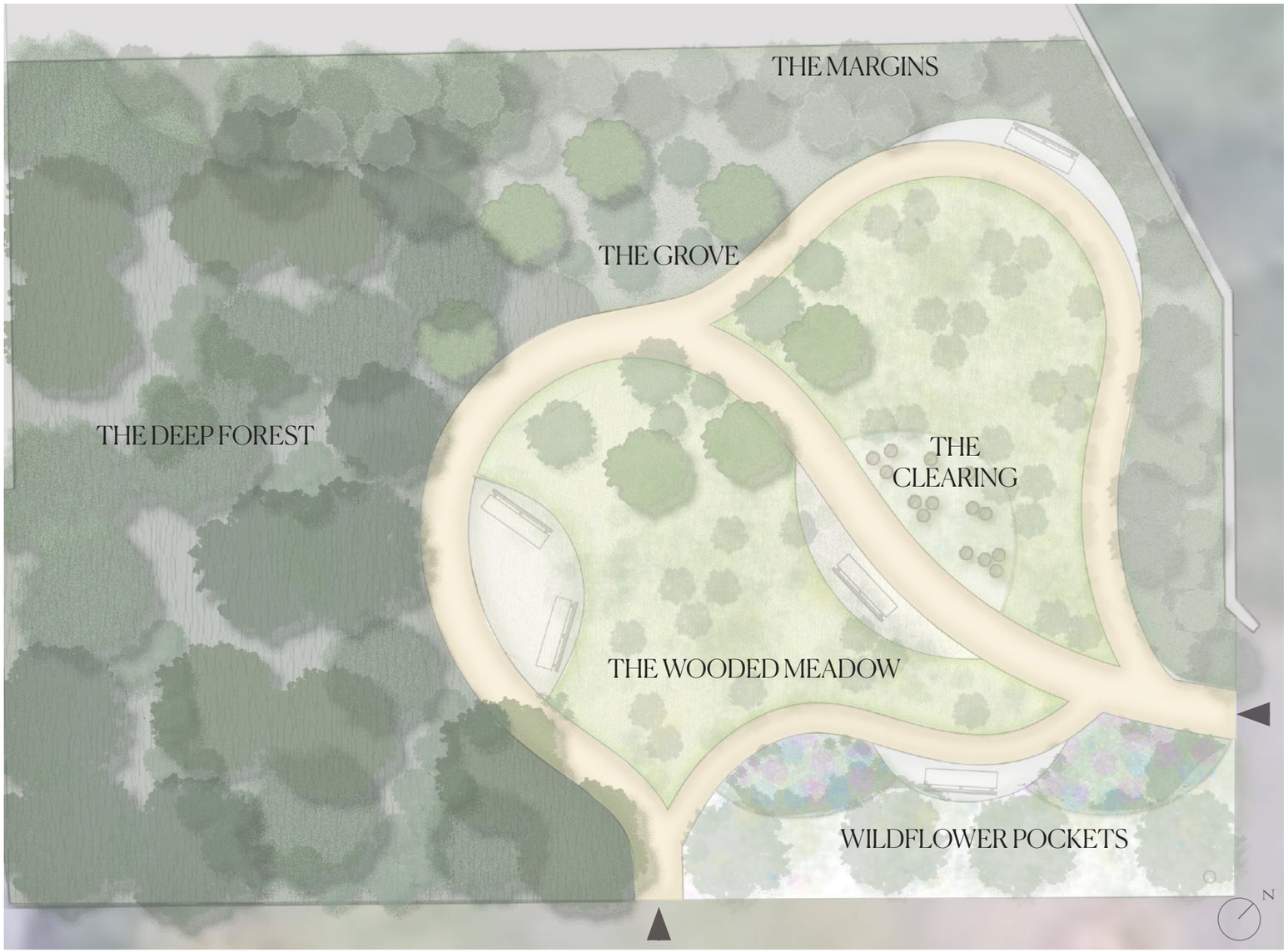
Proposed Layout



This landscape is designed as a *playful ecological trail*, inviting the community to engage with and discover Norwalk's native ecosystems. It encourages exploration of diverse habitats like MicroForests, groves, meadows, and wildflower pockets while promoting a connection to seasonal changes. The space enhances air quality, supports mental and physical well-being, and fosters environmental stewardship, offering lasting benefits for both the community and the broader ecosystem.

THE DEEP FOREST A MicroForest enhances urban biodiversity, sequesters carbon, mitigates urban heat, and fosters resilient ecosystems by creating a dense, self-sustaining habitat for birds, pollinators, and native flora.

THE CLEARING A thoughtfully designed forest clearing with retained tree stumps and logs enriches biodiversity, supports fungi and decomposers, and offers a natural play and seating area for children, blending ecological restoration with community engagement.

THE MARGINS The edges between ecosystems where forests meet meadows or wetlands are hotspots of biodiversity, fostering a dynamic interface for pollinators, birds, and small mammals while increasing habitat connectivity and resilience in an urban setting.

THE WOODED MEADOW A meadow enhances soil health, reduces maintenance needs compared to lawns, supports pollinators, and provides seasonal beauty while acting as a sponge for stormwater, helping mitigate urban flooding in Norwalk.

THE GROVE Located at the meeting of different paths, the tree grove serves as a natural wayfinding element while providing crucial ecological benefits such as cooling the air, filtering pollutants, retaining stormwater, and offering shelter and nesting sites for wildlife, all while creating a peaceful shaded space for the community.

THE WILDFLOWER POCKETS Small pockets of vibrant wildflowers will be planted with the participation of the local community and children, creating a pollinator haven, enhancing ecological literacy, and strengthening community bonds through shared stewardship of the landscape.

An Immersive Experience

THE DEEP FOREST

THE CLEARING

THE MARGINS

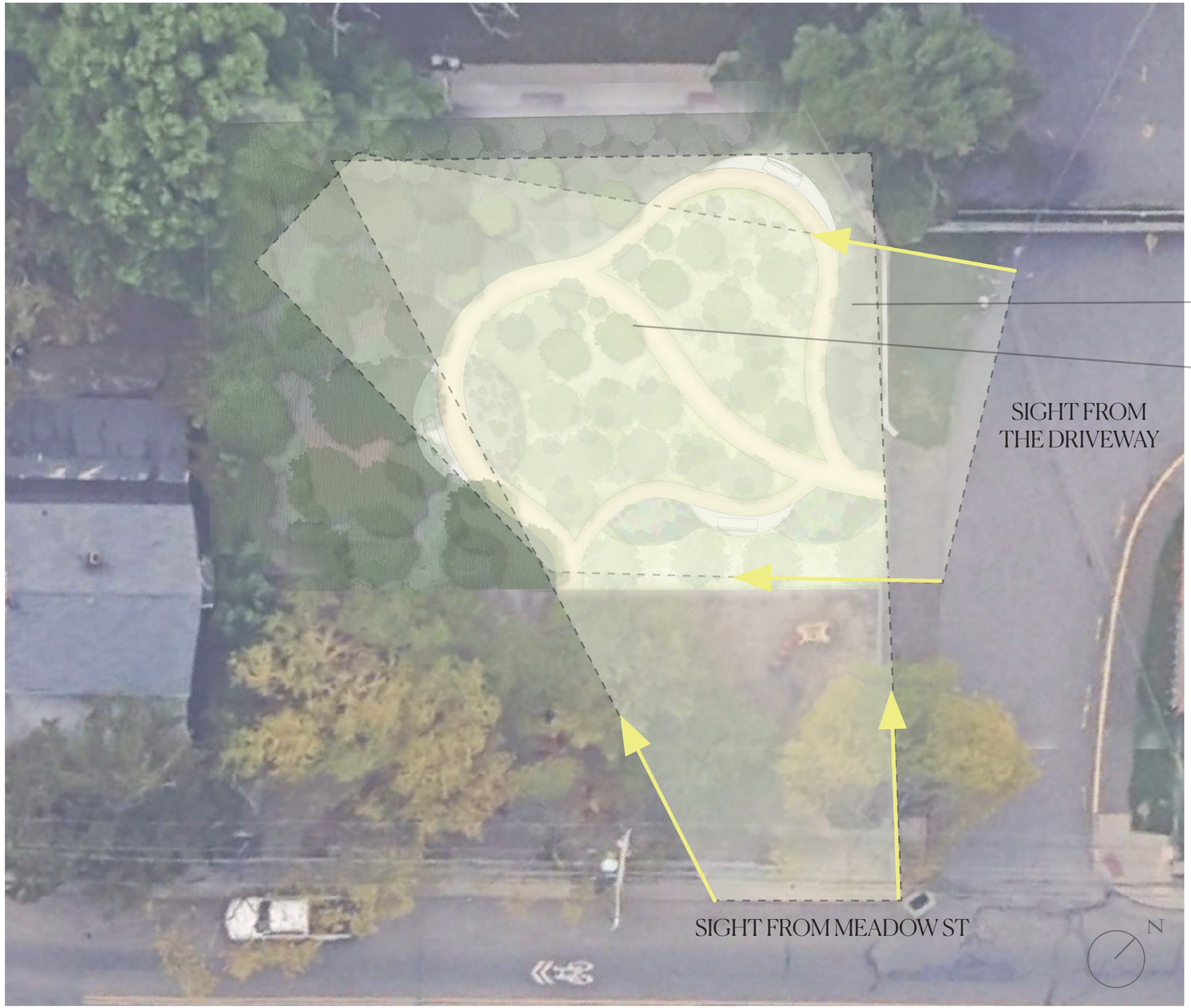
THE WOODED MEADOW

THE GROVE

THE WILDFLOWER POCKETS

This landscape is designed as a playful ecological trail, inviting the community to engage with and discover Norwalk's native ecosystems. It encourages exploration of diverse habitats: MicroForests, groves, meadows, and wildflower pockets while promoting a connection to seasonal changes. The trail offers an immersive experience, allowing visitors to move through a living mosaic of native plant communities representative of the Northeastern landscape. It serves as an educational journey, deepening understanding of the region's ecological composition and the interdependence of its habitats. In addition to enhancing air quality and supporting mental and physical well-being, the space fosters environmental stewardship and offers lasting benefits for both the community and the broader ecosystem.

Site-responsive Design
Viewshed & Sightlines



planting lower than adjacent retaining wall - not obstructing the view from the driveway

canopy higher than sight line (above 6' high)

The balance of clear sightlines and the contrast between open and more contained areas respond to site-specific needs and urban necessities, ensuring safety, accessibility, and ecological function while creating a dynamic and immersive forest experience. A successful urban MicroForest like any well-designed landscape depends on its ability to thoughtfully respond to site constraints and opportunities, optimizing planting density and composition to maximize both ecological benefits and user experience.

Design Proposal
The Deep Forest

A MicroForest enhances urban biodiversity, sequesters carbon, mitigates urban heat, and fosters resilient ecosystems by creating a dense, self-sustaining habitat for birds, pollinators, and native flora in Norwalk.

KEY SPECIES

Quercus alba

Celtis occidentalis

Amelanchier laevis

Lindera benzoin

Corylus americana

Design Proposal
The Deep Forest

The deep forest is the densest and most shaded area of the site, evoking the structure and function of mature northeastern woodlands. It offers essential habitat, carbon storage, and climate regulation while providing a quiet, immersive natural experience for the community.

KEY NATIVE SPECIES

White Oak (Quercus alba) A keystone canopy species that supports hundreds of native insects and provides acorns for birds and mammals.

Hackberry (Celtis occidentalis) A hardy deciduous tree known for hosting butterfly larvae and producing berries for birds.

Smooth Serviceberry (Amelanchier laevis) A small understory tree with early spring blossoms, edible berries, and vibrant fall color.

Spicebush (Lindera benzoin) A fragrant, shade-tolerant shrub that supports the spicebush swallowtail butterfly and produces berries for birds.

American Hazelnut (Corylus americana) A native shrub with edible nuts, providing food for wildlife and habitat for nesting birds.

ECOLOGICAL BENEFITS

Biodiversity Support – Hosts a wide array of insects, birds, and small mammals, forming a vital part of the local food web.

Carbon Sequestration – Mature trees and dense woody vegetation store significant amounts of carbon, helping mitigate climate change.

Microclimate Regulation – Dense canopy cover cools the air, retains moisture, and reduces urban heat island effects.

Seasonal Interest & Habitat – Provides year-round shelter and food, with flowering in spring, fruits in summer, nuts in fall, and structural habitat in winter.

Design Proposal
The Margin

The edges between ecosystems where forests meet meadows or wetlands are hotspots of biodiversity, fostering a dynamic interface for pollinators, birds, and small mammals while increasing habitat connectivity and resilience in an urban setting.

KEY SPECIES

Rhus typhina

Rubus idaeus

Ilex opaca

Vaccinium angustifolium

Aronia arbutifolia

Design Proposal
The Margin

The forest margin where woodland meets open environments like meadows or wetlands is a vital ecological transition zone. These edges are hotspots of biodiversity, offering a rich mix of light, moisture, and habitat conditions that support a wide variety of species. In an urban setting, forest margins play a key role in enhancing habitat connectivity, resilience, and ecological complexity.

KEY NATIVE SPECIES

Staghorn Sumac (Rhus typhina) A striking, fast-growing shrub or small tree with brilliant fall color and clusters of red berries that feed birds.

Red Raspberry (Rubus idaeus) A native bramble that offers sweet fruit for wildlife and humans, while providing protective cover for small animals.

Lowbush Blueberry (Vaccinium angustifolium) A low-growing shrub that thrives in acidic soils and produces highly nutritious berries for birds and pollinators.

Arrowwood Viburnum (Viburnum dentatum) A dense, multi-stemmed shrub with spring flowers, fall berries, and strong ecological value for native insects and birds.

Red Chokeberry (Aronia arbutifolia) A multi-season shrub with spring blooms, vibrant red foliage, and berries that support birds and pollinators.

American holly (Ilex opaca) supports wildlife with food and shelter, boosts biodiversity, stabilizes soil, and helps capture carbon naturally.

ECOLOGICAL BENEFITS

Edge Habitat Diversity – Supports species that rely on transitional spaces, increasing the richness and variety of urban wildlife.

Pollinator & Bird Support – Flowering and fruiting species offer nectar, berries, and shelter throughout the seasons.

Habitat Connectivity – Acts as a corridor that links different ecosystems, allowing species to move safely through the landscape.

Erosion Control & Soil Stability – Dense root systems protect against erosion and improve stormwater infiltration.

Design Proposal
The Clearing

A thoughtfully designed forest clearing with retained tree stumps and logs enriches biodiversity, supports fungi and decomposers, and offers a natural play and seating area for children, blending ecological restoration with community engagement.

KEY SPECIES

Betula populifolia

Aronia arbutifolia

Carex pennsylvanica

Eurybia divaricata

Comptonia pellegrina

Design Proposal
The Clearing

A sunny opening within the forest, the clearing is designed to support early successional habitats, increase biodiversity, and offer a welcoming space for play, rest, and ecological engagement.

KEY NATIVE SPECIES

Gray Birch (Betula populifolia) A fast-growing pioneer tree that thrives in open, disturbed areas and provides early habitat for wildlife.

Red Chokeberry (Aronia arbutifolia) A multi-season shrub with spring flowers and fall berries, offering high wildlife value.

Pennsylvania Sedge (Carex pensylvanica) A native groundcover that forms soft, low mats, ideal for stabilizing soil and supporting insects.

White Wood Aster (Eurybia divaricata) A shade-tolerant, late-blooming perennial that provides essential nectar for fall pollinators.

Sweetfern (Comptonia peregrina) A nitrogen-fixing shrub that improves soil fertility and supports native insects and pollinators.

ECOLOGICAL BENEFITS

Habitat Creation – Supports early successional wildlife, including birds, pollinators, and beneficial insects.

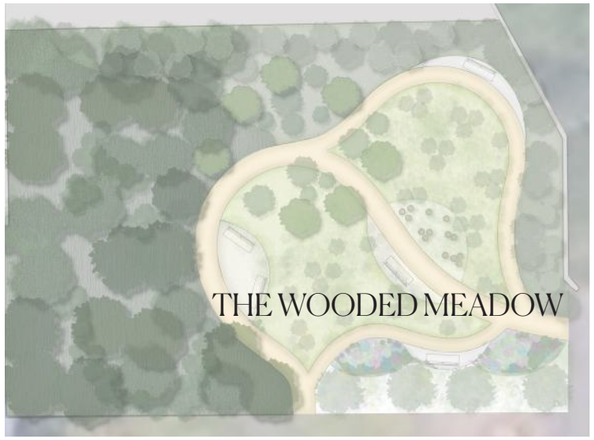
Soil Health & Fertility – Deep-rooted and nitrogen-fixing species improve degraded soils and enhance long-term ecological resilience.

Erosion Control & Water Infiltration – Groundcovers and shrubs reduce runoff and increase soil permeability, helping manage stormwater naturally.

Seasonal Food Sources – Berries, nectar, and foliage offer seasonal resources for birds, bees, and butterflies.

Biodiversity & Resilience – A diverse plant palette ensures year-round ecological function and helps buffer the urban environment from climate stresses.

Design Proposal
The Wooded Meadow



A wooded meadow blends the openness of a meadow with the structural diversity of scattered trees and shrubs, creating a dynamic and ecologically rich habitat. This environment supports a wide range of wildlife while offering the resilience of both forest and grassland ecosystems.

KEY SPECIES

Cornus florida

Baccharis halimifolia

Panicum virgatum

Solidago nemoralis

Rhus coppalina

Design Proposal
The Grove

Located at the meeting of different paths, the tree grove serves as a natural wayfinding element while providing crucial ecological benefits such as cooling the air, filtering pollutants, retaining stormwater, and offering shelter and nesting sites for wildlife, all while creating a peaceful shaded space for the community.

KEY SPECIES

Carya glabra

Celtis occidentalis

Sassafras spp.

Cercis canadensis

Betula lenta

Design Proposal
The Grove

Located at the meeting point of multiple paths, the grove serves as both a natural gathering space and an ecological anchor within the site. It functions as a wayfinding element, drawing visitors in while providing a cool, shaded refuge that invites pause and reflection. The grove's layered tree canopy improves air quality, mitigates urban heat, and supports local wildlife—all within a peaceful, human-scaled space that encourages connection with nature.

KEY NATIVE SPECIES

Sassafras (Sassafras spp.) A distinctive native tree with aromatic leaves and striking fall color that supports pollinators and provides fruit for birds.

Eastern Redbud (Cercis canadensis) A small, early-flowering tree that provides important nectar for early pollinators and adds vibrant spring color.

Hackberry (Celtis occidentalis) A hardy, urban-tolerant tree that hosts butterfly larvae and produces berries for birds.

Sweet Birch (Betula lenta) A shade-tolerant native tree with glossy bark and edible sap that offers year-round interest and supports native insects.

Pignut Hickory (Carya glabra) A sturdy, long-lived tree that provides nuts for wildlife, deep roots for soil health, and contributes to long-term carbon storage.

ECOLOGICAL BENEFITS

Urban Cooling & Air Purification – Tree canopies shade hard surfaces, reduce ambient temperatures, and filter airborne pollutants.

Stormwater Retention – Deep-rooted species improve infiltration, helping to manage runoff and reduce erosion in densely built environments.

Habitat Provision – Offers food, shelter, and nesting opportunities for birds, insects, and small mammals, enhancing urban biodiversity.

Seasonal Beauty & Pollinator Support – Spring blooms, autumn foliage, and textured bark provide year-round visual interest and ecological value.

Wayfinding & Community Identity – As a focal point in the landscape, the grove enhances spatial orientation while creating a welcoming, nature-rich social space.

Design Proposal
The Wooded Meadow

A wooded meadow blends the openness of a meadow with the vertical structure of scattered trees and shrubs, forming a dynamic, ecologically rich habitat. This type of landscape supports a wide variety of wildlife while offering the combined resilience of both grassland and woodland ecosystems. In an urban context, it enhances biodiversity, improves stormwater management, and provides a beautiful, low-maintenance green space that evolves with the seasons.

KEY NATIVE SPECIES

Grasses: Switchgrass (Panicum virgatum) A deep-rooted, drought-tolerant native grass that stabilizes soil, improves infiltration, and provides essential habitat for pollinators and nesting birds.

Perennials: Goldenrod (Solidago spp.) A keystone species for late-season pollinators, offering abundant nectar for bees, butterflies, and other beneficial insects.

Shrubs: Groundsel (Packera spp.) and Eastern Baccharis (Baccharis halimifolia) Flowering shrubs that support pollinators, offer protective cover for small mammals, and contribute to soil stability and health.

Small Trees: A thoughtful mix of native species that add vertical structure, dappled shade, and seasonal food sources like berries and seeds for birds and insects.

ECOLOGICAL BENEFITS

High Biodiversity – Supports a wide range of species across different strata: groundcovers, flowering plants, shrubs, and small trees.

Pollinator Habitat – Provides abundant forage and shelter for native bees, butterflies, and other pollinators critical to healthy ecosystems.

Stormwater Absorption & Soil Health – Deep-rooted grasses and shrubs improve water infiltration, reduce runoff, and enrich the soil.

Climate Resilience – With diverse species adapted to various conditions, the wooded meadow remains robust against drought, heat, and other climate pressures.

Seasonal Change & Visual Interest – Offers year-round ecological activity and beauty, from spring blossoms to golden fall foliage, enriching the urban experience and fostering community connection to nature.

Design Proposal
The Wildflower Pockets

The wildflower pockets is envisioned as a vibrant, joyful, and colorful corner of the park designed not only for ecological impact, but also as a meaningful participatory project.
Planted in collaboration with local children and community members, this space fosters a sense of ownership, pride, and connection to nature. It serves as a gateway to understanding native ecosystems, building lasting relationships with the land, and deepening the community's bond to this special park and its growing MicroForest.

KEY SPECIES

Asclepias incarnata

Aquilegia canadensis

Desmodium canadense

Iris versicolor

Geranium maculatum

Design Proposal
The Wildflower Pockets

The wildflower pockets is envisioned as a vibrant, joyful, and colorful feature of the park designed not only for its ecological value, but also as a meaningful, community-driven initiative. Planted through the active participation of children and local residents, it encourages a sense of shared ownership, pride, and connection to the landscape. This collective effort becomes an entry point for learning about native ecosystems, cultivating care for the environment, and strengthening the community's relationship to the park and its evolving MicroForest.

KEY NATIVE SPECIES

Wild Columbine (Aquilegia canadensis) A delicate early-blooming flower that attracts hummingbirds and adds vibrant red to spring landscapes.

Wild Bergamot (Monarda fistulosa) A pollinator favorite with fragrant lavender blooms that draw bees, butterflies, and hummingbirds.

Blue Flag Iris (Iris versicolor) A moisture-loving perennial with striking purple-blue flowers that support native insects and enhance visual appeal.

Showy Tick Trefoil (Desmodium canadense) A nitrogen-fixing plant with soft purple flowers that improve soil fertility and attract native pollinators.

Wild Geranium (Geranium maculatum) A woodland edge species with long-lasting pink blooms, offering nectar and habitat for early-season pollinators.

ECOLOGICAL BENEFITS

Pollinator Support – Provides abundant nectar and pollen for bees, butterflies, and other native insects, enriching local biodiversity.

Soil Health & Fertility – Native species improve soil structure, fix nitrogen, and increase stormwater absorption.

Seasonal Beauty & Learning – Bursting with color from spring through fall, the pockets becomes a natural classroom for ecological education.

Community Engagement & Stewardship – Planting together fosters intergenerational collaboration, strengthens community ties, and instills environmental responsibility.

Place-Based Identity & Joy – This lively, co-created garden becomes a symbol of shared care, joy, and connection—rooting the community in the identity and future of this evolving urban forest.

Deep Forest Plot Density
Gradient of density

Planting Density and Its Impact on MicroForest Performance

The deep forest plot will also serve as a research site to study how planting density influences establishment in MicroForests. This presents a valuable opportunity to design a robust, replicable study that can be implemented across future research plots. By doing so, we can gain meaningful insights into how planting density affects growth rates, mortality, establishment success, and long-term maintenance costs ultimately informing best practices for MicroForest design and management.

Experimental Plot Layout

Three planting density treatments:

- Full density ~ 2,200 sq ft
- ¾ density ~ 1,500 sq ft
- ½ density ~ 1,950 sq ft

Plant List
Trees

Quercus alba

Celtis occidentalis

Amelanchier laevis

Lindera benzoin

Magnolia virginiana

Quercus palustris

Acer rubrum

Liquidambar styraciflua

Cornus florida

Sassafras spp.

Plant List
Trees & Shrubs

Betula papyrifera

Cornus alternifolia

Tilia americana

Amelanchier spp.

Carya glabra

Cercis canadensis

Betula lenta

Viburnum acerifolium

Rhus coppalina

Vaccinium angustifolium

Plant List
Shrubs

Hamemelis virginiana

Corylus americana

Vaccinium angustifolia

Aronia arbutifolia

Baccharis halimifolia

Fothergilla major

Rhus typhina

Rubus idaeus

Viburnum dentatum

Ilex opaca

Plant List
Blooming Herbaceous

Fragaria virginiana

Solidago bicolor

Aster divaricatus

Anemone virginiana

Solidago nemoralis

Eurybia divaricata

Maianthemum racemosum

Pycnanthemum incanum

Baptisia lactea

Actaea racemosa

Plant List
Ferns & Grasses

Onoclea sensibilis

Thelypteris noveboracensis

Osmunda cinnamomea

Comptonia pellegrina

Carex pensylvanica

Andropogon gerardii

Panicum virgatum

Plant List
Wildflowers

Asclepias incarnata

Aquilegia canadensis

Desmodium canadense

Geranium maculatum

Eupatorium hyssopifolium

Iris versicolor

Eutrochium maculatum

Liatris spicata

Asclepias tuberosa

Monarda fistulosa

Ecological Stewardship Best Practices

Successful rehabilitation of the biodiversity of a landscape and its associated environmental benefits is ultimately dependent upon the care and stewardship of the new habitat. Below is an outline of Plan it Wild's best practices.

WATERING

Plants should be watered regularly until they are established, which could be anywhere from 1-3 years. Don't water the leaves; water the soil, which is where the plants obtain their water. Water every other day for the first two weeks after planting, unless it's rainy weather. Do not water if the soil is already moist. Once established, weekly watering is necessary during the hottest months. If during a drought, you'll need to water most likely every other day.

WEEDING

The more densely planted a restoration site is the less trouble you'll have with weeds. Nevertheless, invasive plants pose serious threats to newly established habitat. First, you must learn to distinguish weeds from native or innocuous plants. Once you've done that, weed weekly during the first year of plant establishment and when necessary after that.

NO CHEMICALS

The chemical products used in traditional horticulture are poisonous to the land and water. For decades, these chemical have polluted the soil, run-off into our local waterways, and diminished if not locally extirpated many species. Typically, 104 pounds of greenhouse gases are emitted per year to keep an average lawn weed free. It is harmful to us, our environment, to wildlife, and our drinking water. And not necessary.

DEER & INVASIVE WILDLIFE

Fencing is the best option to keep these animals from eating newly established plants. There are organic deer and animal repellent sprays and granules that can be applied periodically, but read the directions. We recommend you use different products and alternative their application so an animal doesn't adapt to one product.

NO MOW or DECREASED MOWING

Mowing once a week throughout the growing season produces 937.6 pounds of greenhouse gas emissions a year. Mowing also eradicates the biodiversity in the area. Committing to No Mow would offset the above; committing to less mowing will diminish the deleterious effects of the above, including noise pollution. If a mowing regime is necessary, use or hire a landscaper that uses electric equipment.

LEAVE THE LEAVES

Leaves are nature's mulch. They are habitat, especially during the winter, to countless species, including small mammals, amphibians, but mostly bacteria, fungi, and other tiny orgasms that are vital to ecological function, including the addition of essential nutrients to the soil. The leaves store carbon. We will leave the leaves in place or use them in planting beds or restoration sites as mulch.

SPRING CLEAN-UP

We delay clean-up until average soil temperature reaches 50 degrees, usually in early to mid-May. This allows breeding animals, including insects, to complete their reproductive cycles. We then remove the piled up leaves and use them as organic fertilizer and mulch throughout the yards, but especially in newly planted gardens and habitats.

MONITORING

Plan it Wild has develop a unique monitoring system that yields metrics and ratings on plant health, biodiversity, carbon captured, stormwater retained, and temperature reduction. This is essential to understanding how to manage the ecological health of your land over time.