



Urban
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MAKE EVERY SQUARE FOOT COUNT

THE SHORT STREET NATURE PRESERVE & PLAY SPACE

ADAPTIVE MANAGEMENT PLAN



Version 1.5 (February 2024)

www.urbanecosystemrestorations.org

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DIRECTIONS: WHERE TO FIND WHAT YOU NEED

PURPOSES OF THIS GUIDE

This maintenance guide is intended to serve many purposes for a range of audiences.

First, it is designed to explain to all those who steward and maintain the project (including the Lakelands Community Association (LCA), LCA volunteers, and LCA landscape teams) what must be done in the near-term to ensure the site succeeds, how key features of the site should be maintained, and where to go for warranty concerns or to replace key features. It is also intended to act as a “living” maintenance guide – meaning that it should be updated as the plant communities move and change and as the oversight team develops knowledge about what works at the site and what doesn’t. Since the project is a “living” project that will grow and change, this guide must also grow and change with it.

Second, it is designed for the LCA, as well as individual community members (and others), to explain how the site was designed, the purposes and history of the project, and how it is intended to be used. These aspects of the guide are included both to inform maintenance actions and so that others may use this knowledge to create similar projects in other locations.

CHEAT SHEET: WHERE TO LOOK

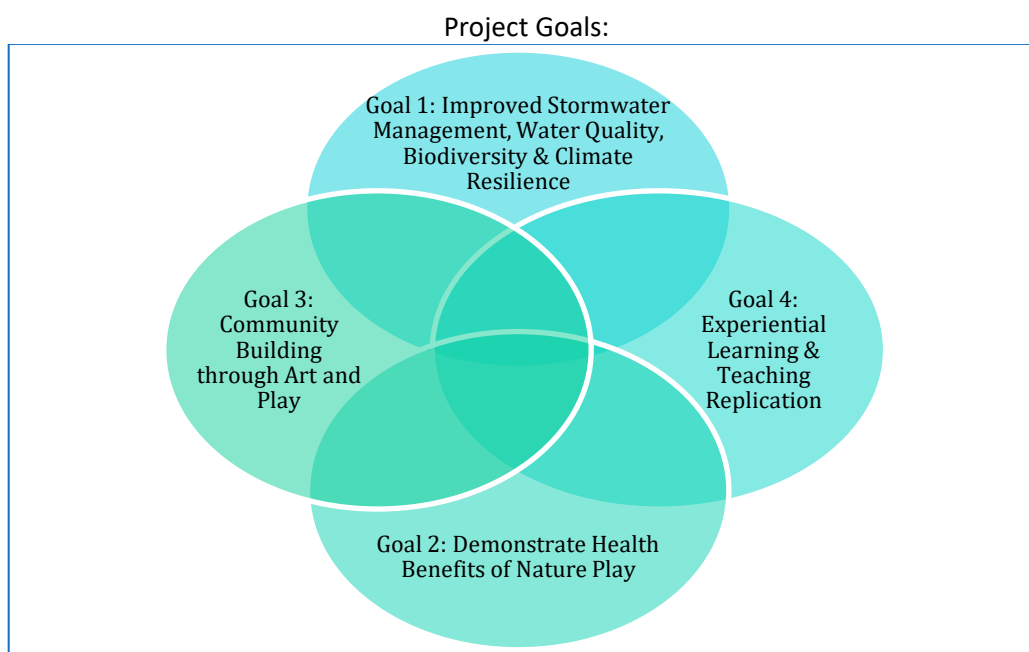
1. For top maintenance priorities through spring 2024, see “Priority Items – First Year” and Appendix 3;
2. For plant species and locations, see Appendix 1;
3. To understand the design objectives and original project goals of the Short Street Nature Preserve and Play Space, review “Background: Project Goals & Related Design Features”;
4. To understand how the site is supposed to function and its long-term maintenance needs, review the “Maintenance Guidelines (Long Term)” in full;
5. For information on the major invasive plants of concern, review Appendix 2;
6. If you need to replace non-plant materials at the site (e.g., stone, logs, etc.), you can find information about the materials that were used under the “Managing Runoff” and “Nature Play” subsections of the “Maintenance Guidelines (Long Term)” and in Appendices 5 and 6.

PRIORITY ITEMS – FIRST YEAR

- Maintain mulch path – see Appendix 3
- Manage/remove invasive plants (Japanese Stiltgrass) – see Appendix 4
- Water new plant plugs through autumn 2023 (detailed instructions below)
- Remove stakes from around bushes and trees – no later than spring 2024
- Ensure signage accurately reflects plants in meadows (and replace missing plants if necessary)

BACKGROUND: PROJECT GOALS & RELATED DESIGN FEATURES

The Short Street Nature Preserve and Play Space was designed to meet numerous environmental and social goals through a multi-functional design. These include: (i) improving stormwater management and reducing stormwater runoff entering the Muddy Branch Creek, and increasing biodiversity and climate resilience of the nearby area; (ii) introducing nature play (i.e., play – whether active or passive – in the context of natural elements and habitats, that engages people with the natural elements, materials, organisms, and habitats through sensory, fine motor, and gross motor experiences) and its health benefits to the community; (iii) inspiring people to experience the joy of adopting sustainable landscaping practices by playing in nature spaces, building community connections there, and engaging with nature through art; and (iv) teaching people how to replicate the experience of nature and nature play in their own yards.



This Adaptive Management Plan is intended to help the Lakelands Community Association and its contractors maintain the design features that promote these goals and ensure that the space continues to thrive into the future. Specific design features implemented to serve these goals are:

1. Goal 1: Two wet meadow areas with small berms and dense native plantings capture and infiltrate stormwater and support biodiversity and ecosystem function;
2. Goal 2: Play and engagement features like the mulch walking path (to bring people “into” the wet meadows and allow immersion in wildflowers and tree-canopy-covered areas), wood playhouse, tree stumps, and climbing ramp all serve to introduce visitors to nature play and enable both active and passive uses in nature for health benefits;
3. Goal 3: Nature poles adorned with nature art from residents, nature play area with interactive “find and seek” signs to encourage interactions directly with nature and to enable conversation and connections among neighbors and walking and sledding paths for people to traverse the site together or meet others there.

4. Goal 4: Interactive signs and associated webpage provide deeper environmental education about the space; walking and sitting areas enable people to observe the space in order to replicate it in their own yards. This goal is primarily served through accompanying educational webinars and events – both in the space and online – rather than through specific design features.
5. An additional goal of the design was to promote resident safety by encouraging play in the upslope areas (away from the gray infrastructure and rip-rap) while controlling/limiting movement in the low-lying areas (in the basin) around the gray infrastructure and rip-rap. As such, more open areas with play features are located upslope, while dense plantings are located downslope (with the intention of limiting human presence to the mulch walking path).

DESIGN INTEGRITY

To ensure that site maintenance preserves the design integrity and project goals, it is important to maintain the key features that serve these goals.

Key aspects of the design are:

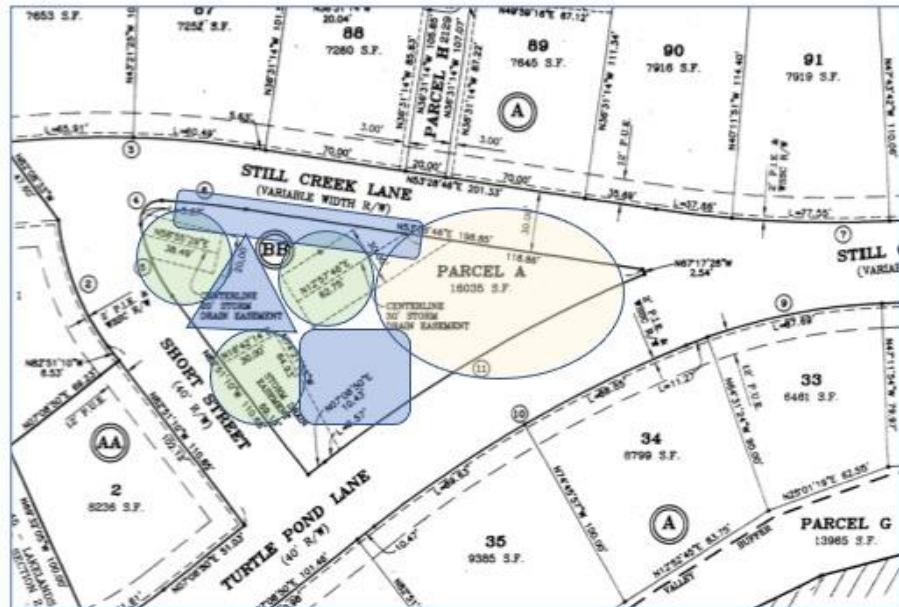
- Nature play area (playhouse, trees stumps, climbing ramp, perch & telescopes) (upslope)
- Educational/play signage at “look out” perch with telescopes
- Two wet meadows full of wildflowers that support birds and pollinators (downslope)
- Understory trees and bushes to add forest structure, manage stormwater, and limit entry points
- Densely planted hillsides with native grasses, bushes, and trees that will stabilize soils, capture runoff from surrounding streets, and add “immersive” experience in nature when in the space
- Walking/running paths & sledding/sliding/running sections along slopes

Original design intent:

Yellow: nature play area – landing/fort/ “hideout”; active play and educational features. Discuss slide and sledding areas; possible add’l trees to ensure shading. Add seating; add buffers between play and other areas.

Blue: SWM, erosion control – unrestricted (bottom basin for understory trees and shrubs that like wet areas but are drought tolerant; inkberry or similar shrubs lining Still Creek Lane)

Green – SWM, restricted by easements (rely on taller perennials – milkweed, iris, use plant density to reduce heavy use and promote biodiversity)



Therefore, it is essential to maintain the wet meadows and hill slopes as densely planted areas with native plants and trees that manage stormwater, promote biodiversity, create vertical structure within the ecosystem, add shading and moisture retention in the soils, and promote climate change resilience. See sections below with specific maintenance guidance about plantings.

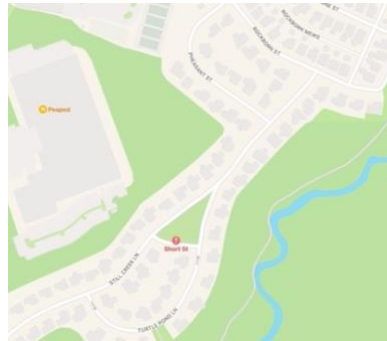
It is also essential to maintain the area’s nature play features (i.e. wooden playhouse, tree stumps, climbing ramp, lookout perch/telescopes, and educational signs, walking paths) to promote interaction and immersion in nature through active and passive activities *that do not disturb the natural areas or ecosystem structure*.



Finally, there are more traditional sections of the project, included for entry points and foot traffic, such as the turf grass patch and sledding path that were incorporated to maintain continuity with neighborhood priorities and comfort levels.

LOCATION

At the triangular stormwater management basin located within the intersection of Short Street, Still Creek Lane, and Turtle Pond Lane in Gaithersburg, MD 20878.



MAINTENANCE GUIDELINES (LONG TERM)

LEAF MANAGEMENT AND MULCHING

Leaf Management

- Do not remove leaf litter that falls into the project area; natural leaf fall should be used as an alternative to mulch.
 - Allow approximately 2” of leaves to remain in the planted areas. If too thick, redistribute and ensure they are not crushing plants. If leaves are matted together in wet clumps, see below.

- If surrounding neighbors blow their leaves into the area, be sure leaves are not thicker than recommended depth.
- Clear leaves off of mulch paths.
- Watch the beds for signs of leaf compaction or clumping due to heavy rain or snow fall. If leaves are compacted (i.e., sticking together in thick mats) on top of existing plant material, fluff up the leaves so that they dry, crunch them into smaller pieces if possible, and clear them off the tops of the plants.

Mulching for Planted Areas (if necessary)

- Once the plantings are established, additional mulching is not desirable unless there is significant replanting or soil disturbance.
- Keep mulch away from plant stems; leave at least 1" bare around herbaceous plants and 3" around shrubs. Avoid piling mulch on living plant material including leaves.
- Always use undyed, shredded hardwood mulch.
- Avoid filling low-lying areas surrounded by berms with mulch: this undermines the purpose of the berm.
- Mulch should never be more than about an inch thick. If small amounts of mulch are displaced – redistribute mulch from within the existing beds.

Mulching for Paths

- Mulching the paths should not be needed on a regular basis; however, the paths should be kept clear, stable, and level enough to walk and run on. See Appendix 3 for maintenance of mulched paths.

MANAGING RUNOFF: 2 WET MEADOWS; 2 BERMS; 2 NET LOGS; MULCH PATH

Wet Meadows

The two wet meadows were installed in the lower lying areas within the basin (noted on the concept plans as Areas E and H) where water will flow if unimpeded. These areas are where drains to the Muddy Branch are located. Part of the design intent is to capture and collect water in the wet meadows before it enters the drains, so that plants can use the water and allow the rest to infiltrate into the soil. Until the plants are mature, the berms will help accomplish this goal. Only overflow water (during heavy rains) should now flow into the drains at the bottom of the basin by Short Street.

Views of Large Wet Meadow (below)



Views of Small Wet Meadow (below)



Berms

- The berms were constructed with compacted soil. Berms are designed to retain water in place and infiltrate in a specific location.
- There are two berms at the site – one at the lowest part of each wet meadow. See chart below.
- For the most part, the berms are intended to be temporary – until the plants can mature and densify. It will be helpful to maintain the berms during the first year, if possible (i.e., until summer 2024)

Berm in Small Wet Meadow (Area H)



Berm in Large Wet Meadow (Area E)





Net Logs

- The net logs were installed to slow and spread rapid, intense flows of water runoff in specific locations.
- First net log is placed around stormwater drain in Area F (at the edge of Area E, where overflow runoff leaves the large wet meadow)
- Second net log is placed along the border with Still Creek Lane, where intense flows of surface runoff enter the project and flow down the hill.

Net logs should not need regular upkeep and should last for approximately 5 years. However, the net log in the basin is experiencing some negative impact from animals. If it degrades to the point of

ineffectiveness, it may need to be replaced. The installation contractor purchased the 18” diameter Coir Log from J&B Fabricators in Millersville MD. The product specifications for the net log along Still Creek Lane are attached as Appendix 6.

First Net log: Edge of Large Wet Meadow	Second Net Log: Edge of Still Creek Lane
	

Mulch Path – Partial Swale & Placement of Stepping Stones

As noted in more depth in Appendix 3, one portion of the mulch path serves as a swale for stormwater runoff from Still Creek Lane that is not captured by the net log or the plants along the hillside. In heavy rains, that excess water will reach the mulch path, which is designed to collect and carry the bulk of that water into a single entry point in the large wet meadow (Area E). Another section of the mulch path that will experience heavy water flow is in the area below the large meadow’s berm. Both of these sections have stepping stones that will stay in place despite forceful flows of water passing over them. The stepping stones should always be securely placed into the path’s soil so that they are not loose or moveable.

TURF GRASS SECTION

Although of limited ecological function, a small turf grass area was retained for children to run down the slope along Turtle Pond Lane or to play near the climbing ramp. This area can also serve as an entry for anyone not entering along paths. This area will need to be mowed with the same frequency as the turf grass borders of the space along the surrounding roads. It will be essential to mow often so that the grasses from that section do not seed and spread in other areas of the project.



WEEDING & INVASIVE PLANTS

- None of the plant species on the planting plan (or featured on the “find and seek” signs) are weeds.
- There are invasive plants on site. Invasive plants spread quickly, are difficult to remove, and will take over the entire project if left unattended. At this time, the primary invasive plant identified at the site is Japanese Stiltgrass, which must be managed (see information specific to this plant in [Appendix 2](#)).
 - To manage Japanese Stiltgrass, LCA should form teams of trained volunteers who can identify the plant and repeatedly remove it (without damaging native plant communities)
- Catching and removing weeds early is a key to successful weed management. It is particularly important to catch annual weeds before they go to seed and create a seed bank. Cut or pull annual weeds before they set seed.
- Learn about other invasive plants of concern at Montgomery County’s Rainscapes Program and Weed Warrior site:
 - ⇒ https://www.montgomerycountymd.gov/water/Resources/Files/rainscapes/Invasives_of_Concern_in_MoCo_pdf.pdf
 - ⇒ <https://montgomeryparks.org/support/volunteer/weed-warriors/>
- Avoid excessive digging or soil disturbance when pulling weeds as this will send weed seeds in the soil and encourage weed growth. Cutting at the base of the plant is often sufficient to kill weeds. If the soil is disturbed while pulling a weed, make sure to tamp it back down and readjust the mulch to cover the disturbed area.

WATERING

- Following establishment, the beds should not require watering. However, the hillsides (especially those that receive heavy sun) may require watering in prolonged periods of intense heat or drought.
- Evaluate each section independently to determine if watering is needed; if area is already wet, do not overwater.
- If plants do require water:
 - Water the equivalent of one inch of rain, approximately 1-2 minutes.

- Water at the base of the plants using a nozzle with gentle flow. Avoid blasting the plants and soil with high pressure as this contributes to mulch runoff.
- Avoid “sprinkling” the leaves which encourages fungal disease and water loss.
- Water in the AM hours to reduce the likelihood of fungal disease.

NATURE PLAY: “LOOK OUT PERCH”, TELESCOPES, AND “FIND AND SEEK” SIGNAGE

The key features of the nature play design that promote interaction with nature should be preserved, and they should not require much maintenance.

The “look out perch” consists of sections of fence and 3 wood logs. The sections of fence support the educational signage and telescopes for the “find and seek” game that children can play to learn about the native plants at the site.



The signs are weatherproof, but they may need to be re-secured after a long period of time. The perch was constructed by Greener Visions, the installation contractor, and may need occasional refurbishment or repairs.

The official manufacturer’s maintenance manual for the Kompan wooden playhouse is attached as Appendix 5.

The QR code on the signs will lead visitors to a webpage with lots of information about the plants featured on the sign and located at the site. The webpage is currently maintained by UER on UER’s website. LCA and UER may consider transferring the location of the web page to LCA’s website so that LCA can maintain the information as the plant mix evolves and changes over time. ***LCA should ensure that the plants listed on the signs remain healthy and present at the site, so that the content remains relevant. LCA should also keep UER updated about the health of the plants in the wet meadows and help ensure the accuracy of the webpage that describes the plants at the site.***

FERTILIZER

- Do NOT fertilize the Short Street Nature Preserve without consulting with UER first. No commercial nutrient inputs are needed.

PRUNING, DEADHEADING, THINNING, AND PLANT REPLACEMENT

- Pruning is only needed to remove diseased or damaged plant material. Leave seed heads through winter to encourage re-seeding and to support wildlife.
- If necessary for aesthetic purposes, trim back stalks in late winter/early spring. Leave 4-6” of the stem for animal nesting materials. Sprinkle seed heads within the garden areas to encourage reseeding.
- We encourage an approach that allows the plants to fill in the planted sections of the project area. However, once the plants are well established (after year two) it may occasionally be necessary to thin some fast-growing or aggressive plants to favor the growth of less vigorous species. Only thin out plant species that are crowding out or killing others. For more information on how to thin perennials, view [this resource \(https://extension.umn.edu/planting-and-growing-guides/dividing-perennials\)](https://extension.umn.edu/planting-and-growing-guides/dividing-perennials).

- Special note on Area B: Area B was planted to provide a burst of color and to enable direct exposure to the pollinator supportive plants close to the nature play area. It was also designed to limit points of entry to path and ramp areas. The Area B patch will look noticeably different to the immediately adjacent spaces that have either native or turf grasses. If the aesthetics of this area become a problem for the community, please consult with UER how to manage the space differently.

HERBIVORE MANAGEMENT

- See Appendix 4 regarding common deer management techniques and recommendations.

TRASH REMOVAL AND SALTING/DE-ICING

- Watch for any debris and animal waste – remove as needed.
- Avoid piling snow on the beds although it is not necessary to remove snow that has naturally fallen within the bed area.
- Limit the use of de-icing products. Use only as needed and directed on packaging.
- Use salting best management practices (<https://www.iwla.org/water/stream-monitoring/salt-watch/road-salt-best-practices>).

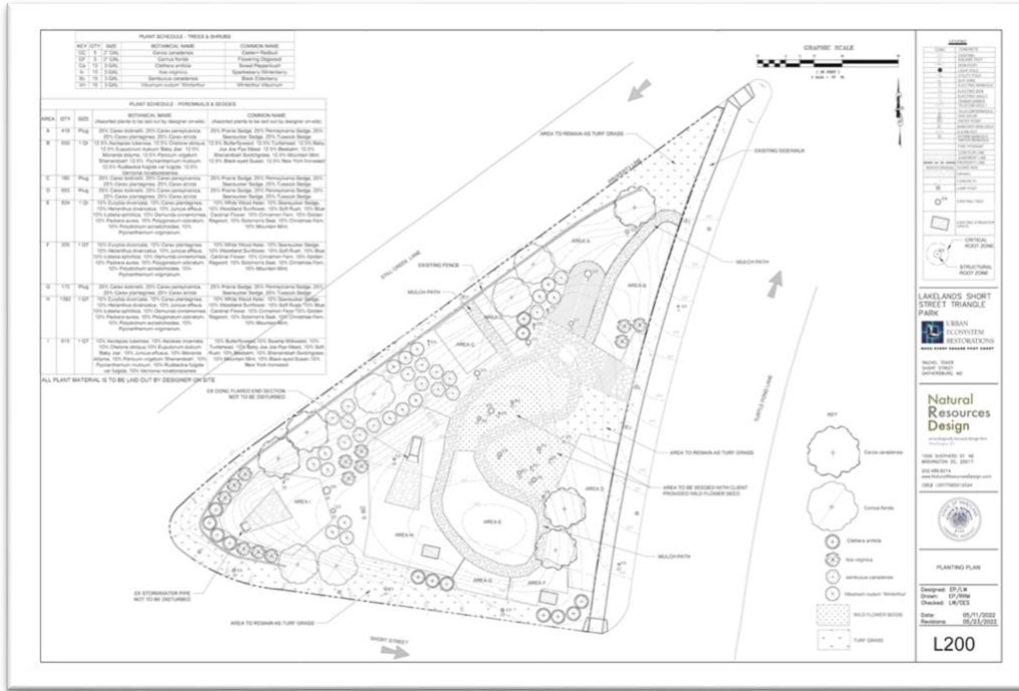
CONTACT INFORMATION

Please copy Rachel Toker and Michele Fuenzalida on all correspondence and reports related to project maintenance.

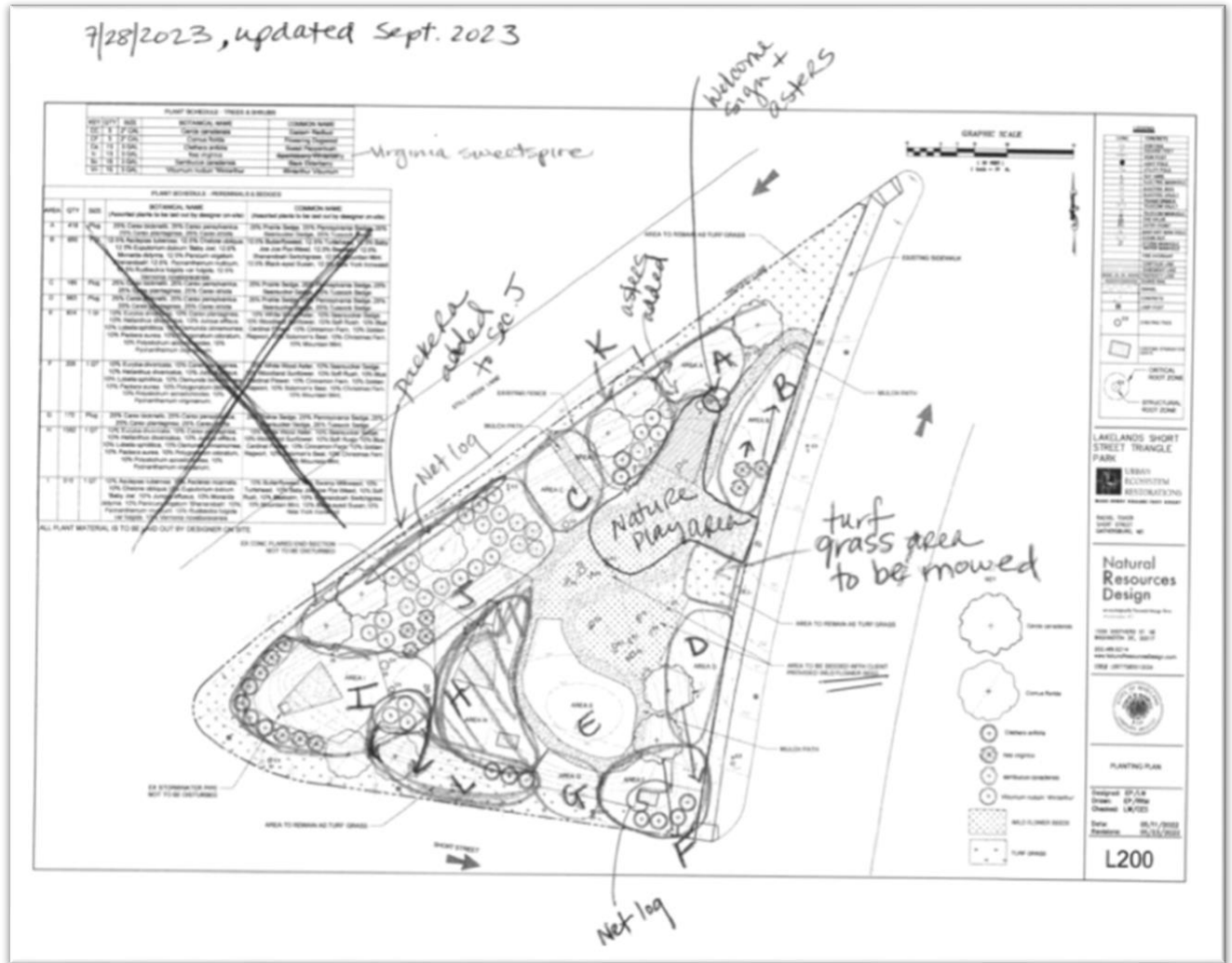
- Rachel Toker, Urban Ecosystem Restorations, rachel@urbanecosystemrestorations.org
- Michele Fuenzalida, Lakelands Community Association, michele@lakelands.org

APPENDIX I: DESIGN OVERVIEW AND PLANT LIST

Background: Original Concept Design and Planting Plan (May 2022) (plan below was subsequently modified). See below for current planting information.



Adjusted Planting Plan (see chart below the diagram for current plant list)



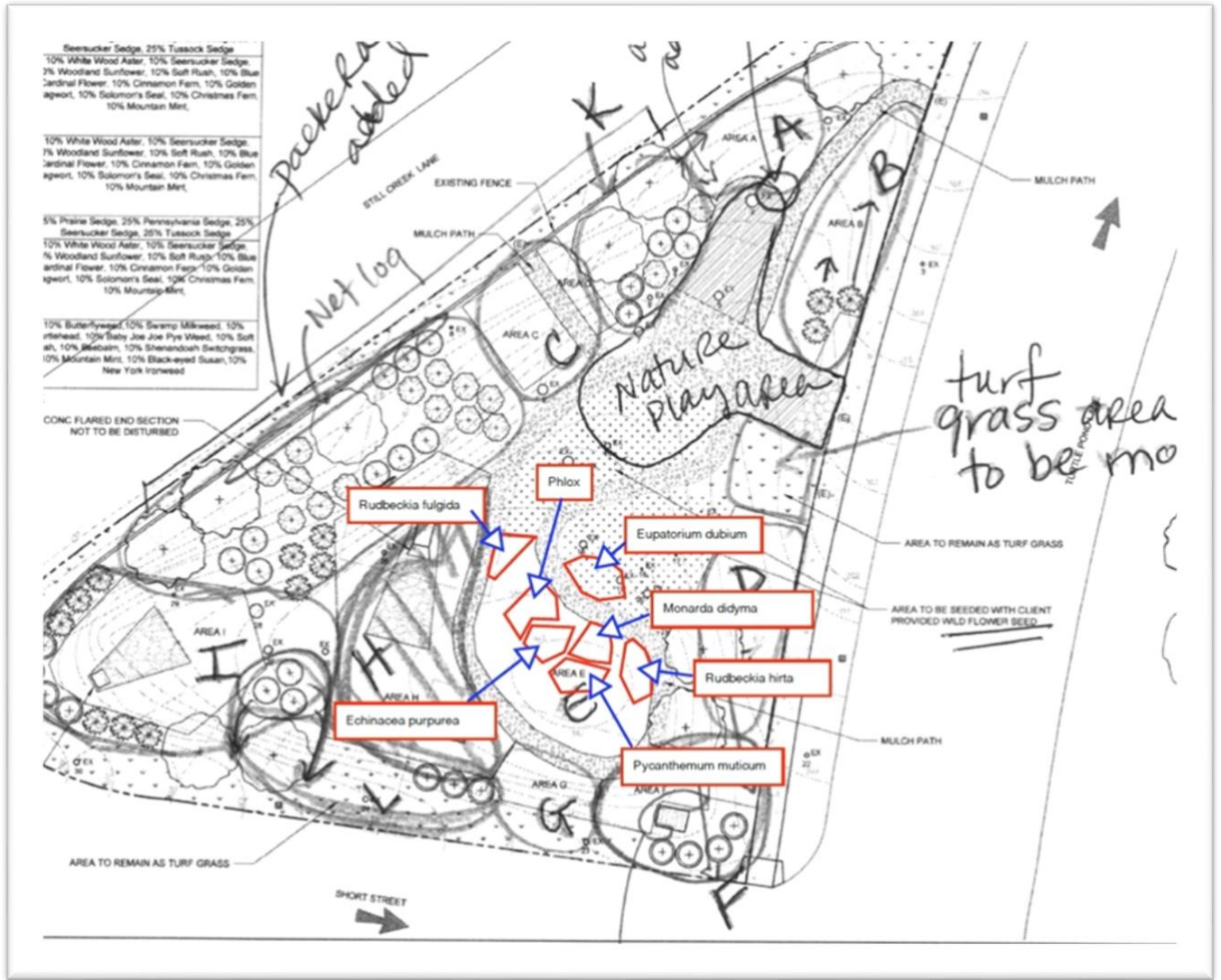
Current Bushes and Perennials by Plan Areas/Sections (as adjusted):

	<i>Plants noted with * may not have survived at the specified location.</i>
Area A, C, D, G	Tussock sedge (<i>Carex stricta</i>); Prairie sedge (<i>Carex bicknelli</i>); Pennsylvania sedge (<i>Carex pennsylvanica</i>); Seersucker sedge (<i>Carex plantaginea</i>); Golden ragwort (<i>Packera aurea</i>) [Areas A and C only]. Aster laevis plugs were also added at the edge of Area A (in the area closest to the corner of Still Creek Lane and Turtle Pond Lane) and around the welcome sign at the path entrance.
Area B	Butterflyweed (<i>Asclepias tuberosa</i>); Red turtlehead (<i>Chelone obliqua</i>); Baby Joe Pye Weed (<i>Eupatorium dubium</i>); Beebalm (<i>Monarda didyma</i>); Shenandoah switchgrass (<i>Panicum virgatum shenandoah</i>); Mountain mint (<i>Pycnanthemum muticum</i>); Black-eyed Susans (<i>Rudbeckia fulgida</i> var. <i>fulgida</i>); New York Ironweed (<i>Vernonia noveboracensis</i>)* Area B bushes: 3 <i>Itea virginica</i> (Virginia sweetspire)

Area E (large wet meadow)	White wood aster (<i>Eurybia divaricata</i>); Black-eyed susans (<i>Rudbeckia fulgida</i>); Soft rush (<i>Juncus effusus</i>); Blue cardinal flower (<i>Lobelia siphilitica</i>); Virginia mountain mint (<i>Pycnanthemum virginianum</i>); Mountain mint (<i>Pycnanthemum muticum</i>); Butterflyweed (<i>Asclepias tuberosa</i>); Baby Joe Pye Weed (<i>Eupatorium dubium</i>); Red turtlehead (<i>Chelone obliqua</i>)*; Christmas fern (<i>Polystichum acrostichoides</i>)*; Seersucker sedge (<i>Carex plantaginea</i>)*; Cinnamon fern (<i>Osmundia cinnamon</i>)*; Solomon's seal (<i>Polygonatum odoratum</i>)* [Rudbeckia hirta, Phlox divaricate, Monarda didyma, and Echinacea Purpurea were added to Area E as replacement plants on Aug. 14, 2023, as noted in red areas marked on plan below this chart]
Area F (corner of Short Street and Turtle Pond Lane)	White Wood Aster (<i>Eurybia divaricata</i>); Virginia mountain mint (<i>Pycnanthemum virginianum</i>); New York Ironweed (<i>Vernonia noveboracensis</i>); Seersucker sedge (<i>Carex plantaginea</i>)*; Blue cardinal flower (<i>Lobelia siphilitica</i>)*; Soft rush (<i>Juncus effusus</i>)*; Solomon's seal (<i>Polygonatum odoratum</i>)* Area F bushes: 4 <i>Clethra alnifolia</i> (Sweet Pepperbush)
Area H (smaller wet meadow)	White wood aster (<i>Eurybia divaricata</i>); Black-eyed susans (<i>Rudbeckia fulgida</i>); Baby Joe Pye Weed (<i>Eupatorium dubium</i>); Soft rush (<i>Juncus effusus</i>); Blue cardinal flower (<i>Lobelia siphilitica</i>); Virginia mountain mint (<i>Pycnanthemum virginianum</i>); Bluestem goldenrod (<i>Solidago caesia</i>); Butterflyweed (<i>Asclepias tuberosa</i>); New York Ironweed (<i>Vernonia noveboracensis</i>); Red turtlehead (<i>Chelone obliqua</i>)*; Christmas fern (<i>Polystichum acrostichoides</i>)*; Seersucker sedge (<i>Carex plantaginea</i>)*; Cinnamon fern (<i>Osmundia cinnamon</i>)*; Solomon's seal (<i>Polygonatum odoratum</i>)*
Area I (around upper corner at Still Creek Lane and Short Street)	Soft rush (<i>Juncus effusus</i>); Shenandoah switchgrass (<i>Panicum virgatum shenandoah</i>); Mountain mint (<i>Pycnanthemum muticum</i>); Red turtlehead (<i>Chelone obliqua</i>); Butterflyweed (<i>Asclepias tuberosa</i>); Red columbine (<i>Aquilegia canadensis</i>). Area I bushes (10): 4 <i>Clethra alnifolia</i> ; 6 <i>Itea virginica</i>
AREA J: Still Creek Lane slope	Area J bushes (26): 9 <i>Winterthur viburnum</i> ; 13 <i>Sambucus canadensis</i> ; 4 <i>Itea virginica</i> . Also added: Golden Ragwort (<i>Packera Aurea</i>); Baby Joe Pye Weed (<i>Eupatorium dubium</i>); Mountain mint (<i>Pycnanthemum muticum</i>).
AREA K (between Area A and Area C)	Area K bushes (7): 2 <i>Clethra alnifolia</i> ; 3 <i>Winterthur virburnum</i> ; 2 <i>Sambucus canadensis</i> (Black elderberry)
AREA L: Slope along Short Street between Area I and Area F	<i>Note</i> : in sloped section where Area L and Area I meet, Red columbine (<i>Aquilegia canadensis</i>) was planted. This plant may have been planted as a replacement for one of the plants listed on the plan but not found at the site. Area L bushes (6): 3 <i>Clethra alnifolia</i> ; 3 <i>Winterthur virburnum</i>

For more information about the plant species included at the site, visit UER's Short Street Project webpage and the page with detailed information about the powerful plants of short street.

Diagram showing Area E's replacement planting locations:



APPENDIX 2: INVASIVE PLANT MANAGEMENT

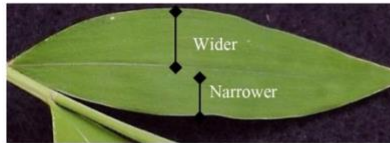
Although there are several aggressive weeds that were thriving at the site prior to project installation, the primary invasive plant at the site is Japanese Stiltgrass.

It's important to know what it looks like and how it spreads. As noted below, it is essential to pull the plant before it seeds in August-September. Consistent weed pulling must occur for multiple years in order to exhaust the seed bank and weaken the population sufficiently for the native plants to outcompete it.

Below is information about the plant from The Nature Conservancy:



Japanese Stiltgrass



Leaf divided into unequal halves, sparse hairs, distinctly tapered at both ends

Stems always hairless, often bend at joints, "stilting"



Distinct silver midrib, marginal hairs on leaf sheath.



Roots fibrous, not rhizomatic, plant roots from nodes.

Do not confuse with:

Cutgrass-native!- longer leaves, can have hairy stems, smooth or pubescent leaf sheath. More erect plant, not "stilting", scaly rhizomatic roots



Japanese Stiltgrass (*Microstegium vimineum*) is an annual plant, one which completes its life cycle in one year and dies after fruiting. Stiltgrass is spread by human activities, deer, or flood waters.

Stiltgrass can quickly dominate the ground cover, replacing native herbaceous vegetation in 3-5 years, and may alter soil conditions. It can grow in nearly every condition except standing water or full sunlight. Because it has no natural predators, it is important to prevent its spread.

Seeds germinate from early spring through summer. Each plant produces up to 1,000 seeds that may remain viable for 5 years or more.



How to treat Plants:

Pull plants and roots gently from the base of plant before they form seed heads. If you can only treat once, best time is August - early September. Leave plants on-site. The best method is to pull 3-4 times throughout the summer—new plants will grow each time from the seed bank and you will help exhaust the seed supply. ***Any plants that have formed seed must be removed from the site in bags and disposed of in trash.***

Below is information about Japanese Stiltgrass taken from the book Plant Invaders of Mid-Atlantic Natural Areas by the National Park Service and the U.S. Fish and Wildlife Service:

Japanese Stiltgrass

Microstegium vimineum (Trin.) A. Camus
Grass family (Poaceae)

Origin: Japan, Korea, China, Malaysia and India

Background

Japanese stiltgrass was introduced into the United States in Tennessee around 1919 and likely escaped as a result of its use as a packing material for porcelain.

Distribution and Habitat

Stiltgrass is currently established in 16 eastern states, from New York to Florida. It occurs on stream banks, river bluffs, floodplains, emergent and forested wetlands, moist woodlands, early successional fields, uplands, thickets, roadside ditches, and gas and power-line corridors. It can be found in full sun to deep shaded forest conditions and is associated with moist, rich soils that are acidic, neutral or basic and high in nitrogen.

Ecological Threat

Stiltgrass threatens native understory vegetation in full sun to deep shade. It readily invades disturbed shaded areas, like floodplains that are prone to natural scouring, and areas subject to mowing, tilling and other soil-disturbing activities including white-tailed deer traffic. It spreads opportunistically following disturbance to form dense patches, displacing native wetland and forest vegetation as the patch expands.

Description and Biology

- Plant: annual grass resembling a small, delicate bamboo; mature plants grow to 2-3 ft. in height.
- Leaves: pale green, lance-shaped, asymmetrical, about 3 in. in length, with a shiny midrib.
- Flowers, fruits and seeds: hidden (cleistogamous), self-fertilizing flowers in axils and/or exposed (chasmogamous) flowers in terminal racemes of paired, hairy spikelets that open and are wind-pollinated; fruits awned and bristly; late summer to fall.
- Spreads: by seed and vegetative spread by rooting at joints along the stem—a new plant can emerge from each node; a single plant can produce 100-1,000 seeds that remain viable in the soil for at least three years, ensuring its persistence; seed germinates readily following soil disturbance. Although dispersal is not fully



Bill Johnson

understood, seeds can be transported by water (e.g., surface runoff, streams, and floodwaters), in soil and gravel, in nursery grown plants, and on the feet of animals including humans.

- Look-alikes: Virginia cutgrass (*Leersia virginica*), hairy jointgrass or small carpetgrass (*Arthraxon hispidus*), and possibly other delicate grasses and wildflowers like Pennsylvania knotweed (*Polygonum persicaria*).

Prevention and Control

Because it is similar in appearance to several native grasses, it is important to know how to recognize and differentiate stiltgrass from look-alikes. Look for asymmetrical leaves with a shiny midrib and the stilt-like growth form. Attention to new infestations should be a priority. Because it is shallow-rooted, stiltgrass may be pulled by hand at any time. If flowering, cut plants back using a mower, weed whip or other device to prevent seed production. For extensive infestations, herbicides are the most practical and effective method currently (see Control Options).

Native Alternatives

Following disturbance to an area susceptible to stiltgrass, stabilize with native vegetation suitable to site conditions.



James H. Miller, USDA FS

APPENDIX 3: FIRST YEAR TASKS (SHORT TERM)

- Monitoring Frequency: Check project every week and after heavy rainstorms.
- Watering: Evaluate for watering needs. Water plant plugs if no significant rain has fallen in 3-5 days or after periods of extreme heat (3-5 consecutive days over 90-degree heat).
- Stakes: Remove both tree stakes and stakes around bush clusters by spring 2024 if all trees and shrubs are growing well.
- Path Maintenance: Stormwater runoff will enter the wet meadows in the direction of the red arrows shown below. In heavy rain (and before the plants have matured – or during winter), the water runoff from Still Creek Lane should run down the mulch path and enter into the large wet meadow as shown below. Until the mulch of the path is compacted, it will be partially carried into the wet meadow with the force of the water flow. Before the path mulch is stable/compacted, it will be important to gently rake or carry the mulch out from the wet meadows (without damaging the plants) and place it back around the stone steps of the path (or anywhere there are missing areas of mulch).



FIGURE 1 VIEW FROM SHORT STREET



FIGURE 2 VIEW FROM UPSLOPE NEAR NATURE PLAY AREA

It will also be important to keep the mulch paths clear of heavy leaf cover and plant growth, and to ensure the paths are not eroded or dangerous year-round, so that people can safely enjoy walking or running around the site on designated pathways.

- Plant damage: Monitor for insect damage or disease. Remediate as needed. Notify UER if you identify animal or plant damage. Prune as necessary to address unsightly damage or disease.

APPENDIX 4: DEER MANAGEMENT PRACTICES AND RECOMMENDATIONS

[SEE ATTACHED]

APPENDIX 5: KOMPAN OUTDOOR PRODUCTS MAINTENANCE MANUAL

[SEE ATTACHED]

APPENDIX 6: NET LOG AT STILL CREEK LANE

[SEE PRODUCT INFORMATION ATTACHED]