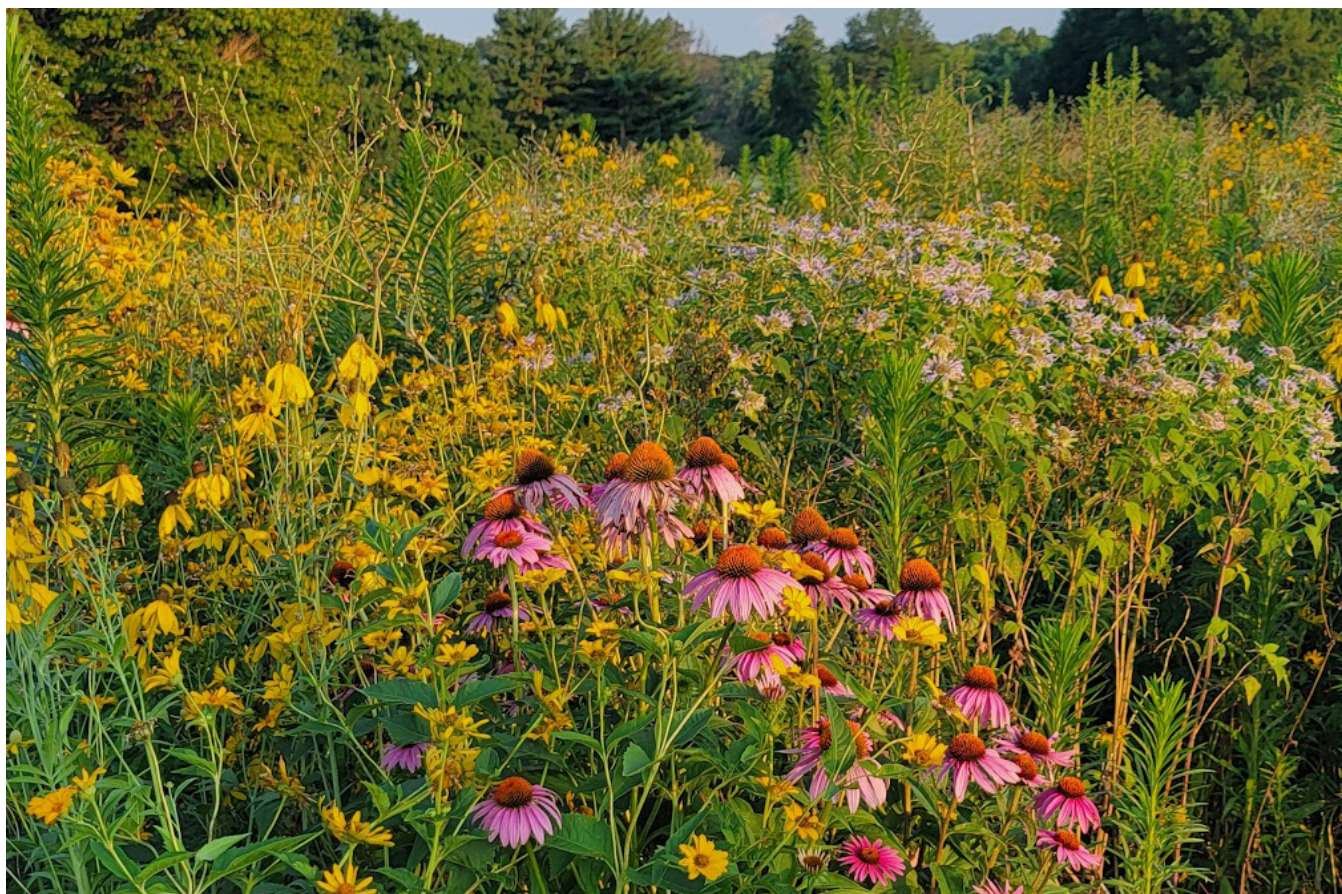


The Collinsville Landfill:

Creating a Biodiverse Community Asset

prepared for the City of Collinsville, Illinois by
HeartLands Conservancy



2022

Acknowledgments



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This document prepared for City of Collinsville, Illinois by Heartlands Conservancy. The proposed improvements/developments identified in this plan were developed in conjunction with City Staff and Heartlands Conservancy.

Cover Photos: Heartlands Conservancy

Table of Contents

The Landfill: Today	4
Overview	
Existing Conditions	
The Landfill: A Resilient Future	10
Vision	
Opportunities & Challenges	
The Action Plan	14
Management Units	
Opportunities & Challenges	
1 Landfill Field - Pollinator Meadow	
2 West Field - City Tree Nursery	
3 Stream Corridor - Stable Banks & Clean Water	
4 WoodLand - Healthy Forest	
Funding Strategy	42



The Landfill: Today

Overview

The City of Collinsville requested **HeartLands Conservancy** to prepare an overall plan for the old Collinsville Landfill. The City would like to reduce the cost of mowing and enhance the natural resource value of the property, as well as provide native plantings for other City owned and managed properties. The plan proposes to convert the cool season grasses to native plantings and trees to support the city's overall goals in sustainability and nature-based solutions. This effort can positively impact the environment and community through the measurable improvement of air and water quality.

To meet the purpose and the objectives of the City, this project plan will provide best management practices to install and maintain a restored prairie and native tree nursery on the property. HeartLands further recommends addressing the erosion and stabilization of Canteen Creek that runs on the north perimeter of the site.

When this initiative is complete, it may rise to be a regional case study in best practices for landfill management and ecological improvements for brownfields.

Existing Conditions

The Collinsville Landfill is located north of the City of Collinsville, IL on the south side of Lebanon Road. The landfill was used for waste disposal from the early 1970s to 1984. Waste disposed at the site had a low percentage of organic matter. The landfill was capped with clay in 1984 with silty loess/clay soil. Over time, several studies have been completed on behalf of the City. The City of Collinsville has since monitored the condition of the landfill cap and pumped and disposed of leachate from the landfill. The soil above the clay cap was planted in cool season grasses and has been mowed twice annually to prevent encroachment by woody species and an accumulation of thatch.

The landfill has suffered from minor erosion issues since being capped. Erosion issues are required to be repaired through the IL EPA permitting and monitoring agreements.

Current Maintenance

Currently, the landfill cap and surrounding areas are planted in non-native cool season grasses, tall fescue and smooth brome, that require mowing twice a year.

A city employee uses a Case IH 110 tractor with a Bush Hog 2810 attachment to cut the grass at approximately six inches in height in early summer, then again in the fall. Each seasonal mowing takes one city employee a minimum of 3 days. In a given year, this management technique requires a minimum of 6 days or 48 man hours of mowing. The tractor uses approximately 50 gallons of diesel fuel to complete the mowing in the year.

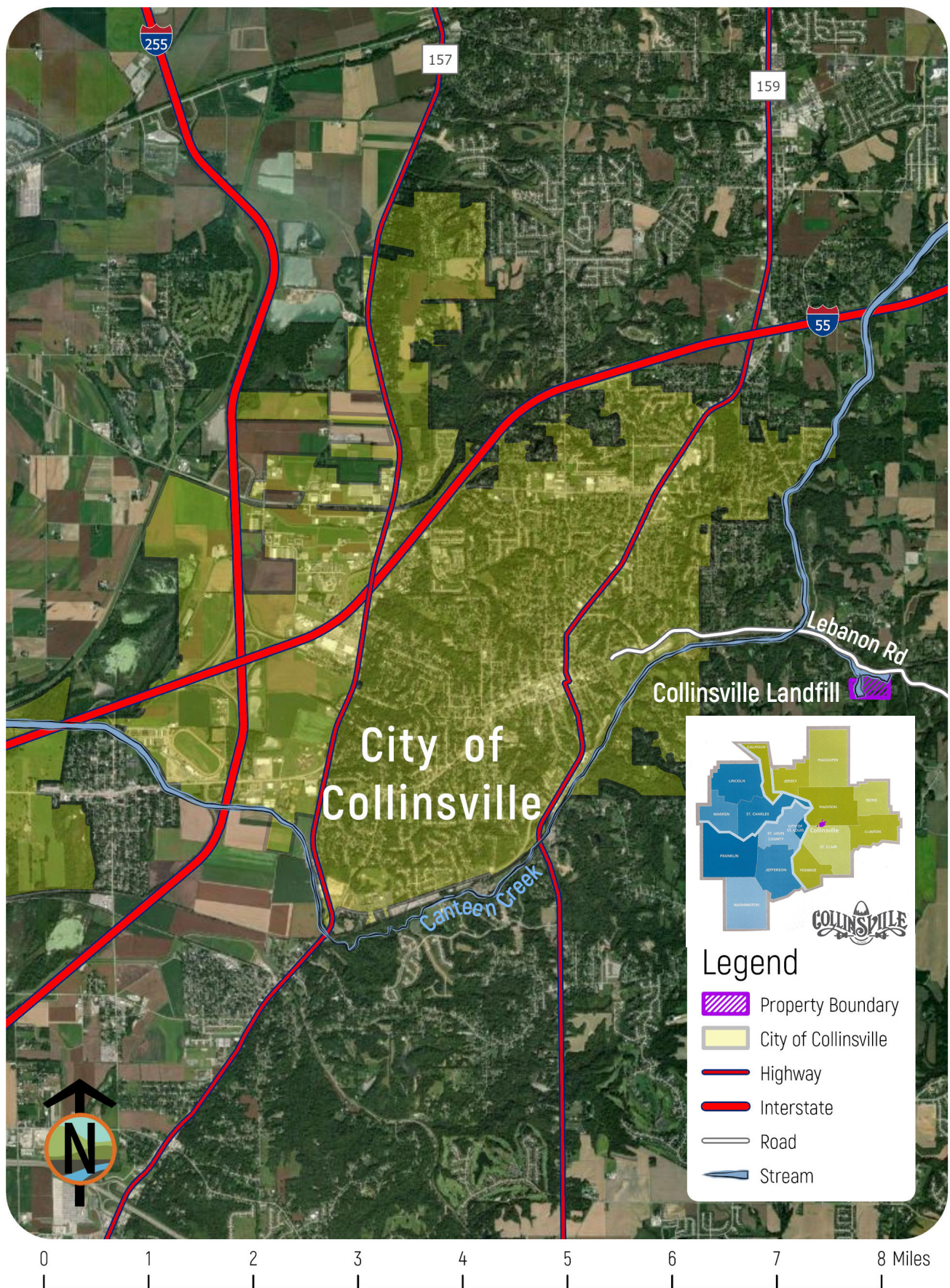


Figure 1: Location Collinsville Landfill

The City of Collinsville estimates that it averages 475 man hours per year to address maintenance erosion issues. The current vegetation and management schedule may contribute to future erosion problems.

As a non-native species, the cool season grasses currently growing at the landfill provide limited nutrition for a small subset of herbivores. While large, charismatic mammals, e.g. white-tailed deer, generally come to mind, insect herbivores play a crucial role in the ecosystem. A variety of insect herbivores feed on native plants and become food for more complex wildlife such as songbirds, bats, and small mammals. Further, non-native insect pests, such as Japanese beetles, benefit from large cool season grass plantings. The larvae of these well-known pests primarily feed on the roots of grasses. After the larval stage, the adults feed heavily on common ornamental plants in the landscaping of local houses.

Native prairie plants have a variety of growth forms that interweave between different plant species creating beneficial, dynamic habitat for a multitude of wildlife species.

Non-native plant species provide minimal value to native wildlife. The leaf tissues of all plants contain secondary metabolites that have evolved to deter herbivores. In turn, herbivores develop enzymes that break down these secondary metabolites making the nutritional resources in the leaf tissues available to the herbivores. The combination of secondary metabolites in plant tissues and enzymes in the gut of herbivores is unique to individual species. Over time, the co-evolution of plants and herbivores in a given ecosystem leads to a balance where plants can deter herbivores enough to allow the plant species to reproduce while herbivores are still able to meet their nutritional needs by grazing on the plant species.

Property Description

Location

The property includes two parcels (Parcel ID 13-2-21-36-01-101-007 and 13-1-21-36-01-101-006) and is located in the northwest ¼ of Section 36, Township 3N, Range 8W west of the Third Principal Meridian, Collinsville Township, Madison County, Illinois. The size of the property is approximately 31.5 acres (Figure 1).

Key Features

Clay Cap: Approximately 19 acres of the 31.5 acre property is a capped landfill (Figure 2). Soil, ranging from 3 - 9 feet in depth, covers a clay cap. A mound typical of landfills is clearly distinguishable but modest in size. The mound can serve as a landmark to where the landfill cap is located, but the capped area extends within feet of tributaries to Canteen Creek (noted as North Stream, West Stream, and South Stream).

Canteen Creek and unnamed tributaries: The creek flows through the property between the boundary of the waste disposal area and Lebanon Road. Canteen Creek enters the property at the northeast corner, flows west to the northwest corner of the property, then continues west to neighboring properties. Another small, unnamed creek enters the property from the south between the west side of the waste disposal area and an open field on the west side of the property and flows into Canteen Creek on the northwest corner of the property. Both Canteen Creek and the unnamed creek cut deep into the surrounding landscape and have steep banks.

A land bridge over the top of a 5 foot culvert connects the waste disposal mound to the west side and field of the property.

Service Road: The loop gravel service road leads to four pump houses.

Pump Houses: Four pump houses pump and store leachate from the landfill. Electricity for the pump houses are supplied by power poles and lines that approximately follow the path of the service road.

French drains: The drains were installed slightly outside the waste boundary to collect leachate before it could enter Canteen Creek. The French drains are approximately 8 feet below the soil surface, but soil depth may vary. A fence begins at the intersection of the service road and Lebanon Road, continues along the entirety of western property line, then stops at the approximate midpoint of the southern property line.

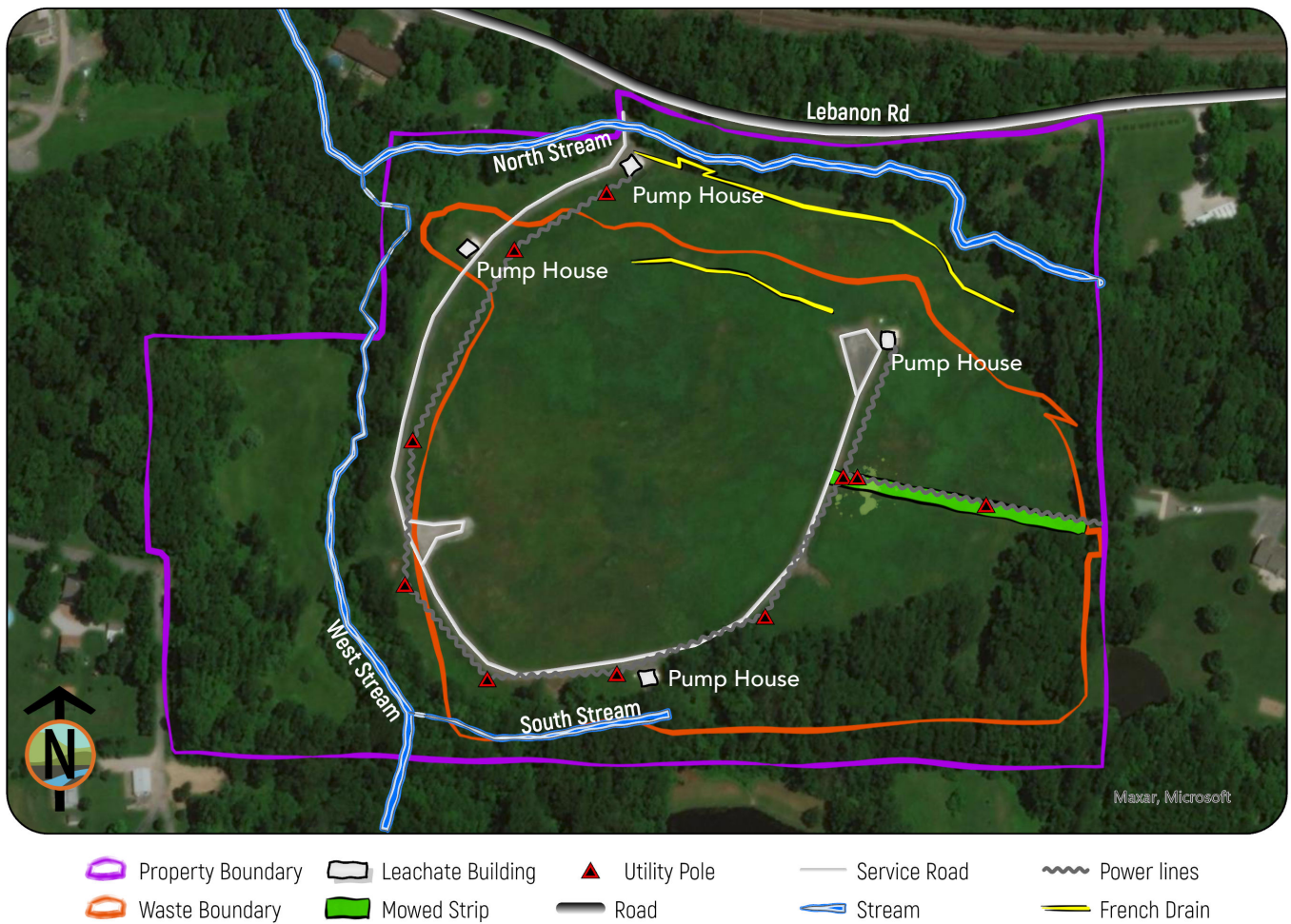


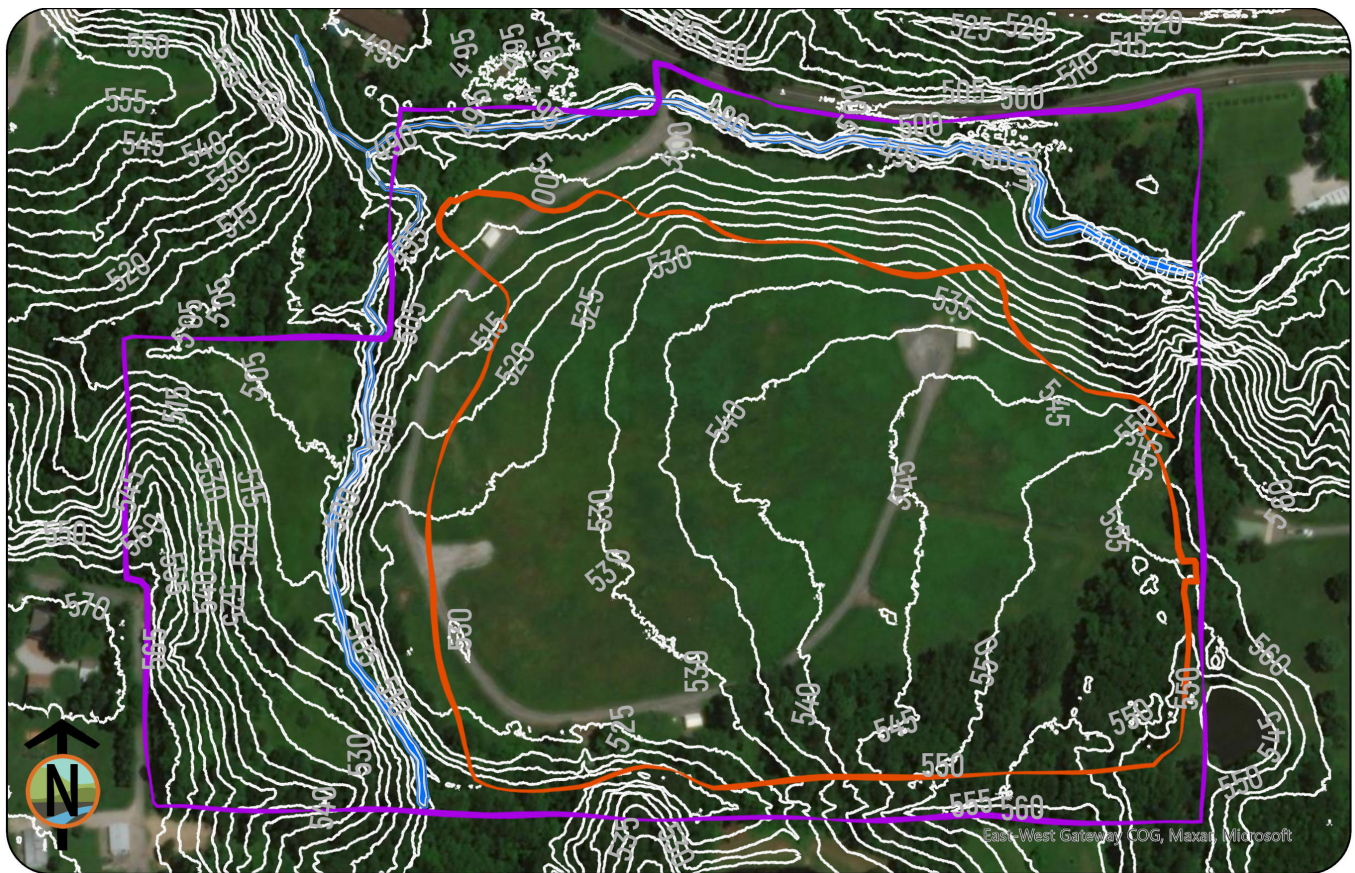
Figure 2: Collinsville Landfill Basemap



Legend

- Uncertain Boundary of Waste
- Boundary of Waste
- Southern/Eastern Landfill Property Boundary
- Extent Area 1 Coal/Gob Storage
- Extent Area 3 Pond
- Creeks/Tributary
- Portion of Area 2. Largest portion of Area 2 is west of the site and off the map





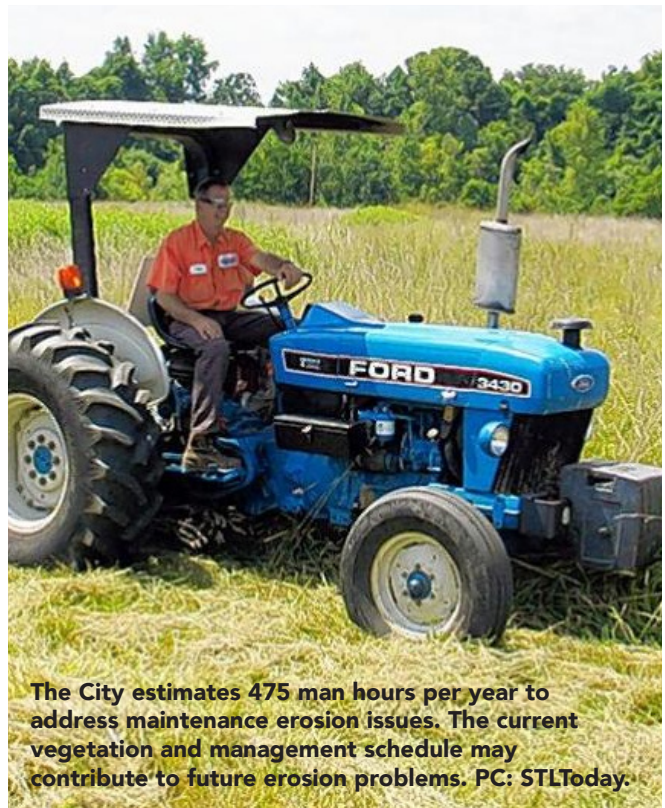
— Property Boundary
 — Waste Boundary
 — Stream
 — 5 foot contour lines

Figure 3: Collinsville Landfill Topography & Landform

Topography

Topography on the site exists beyond the mound of the landfill (Figure 3). Canteen Creek and the unnamed creek that pass through the site have shaped the landscape for thousands of years. Generally, the land slopes and drains down towards the waterways.

Elevation on the site ranges from 490 feet above sea level in the creek bottoms to 565 feet above sea level on the hill tops. On the majority of the site, the slope is less than 5%. However, on the north end of the landfill cap and the western woodland, the slope increases to as much as 30%.



The City estimates 475 man hours per year to address maintenance erosion issues. The current vegetation and management schedule may contribute to future erosion problems. PC: STLToday.

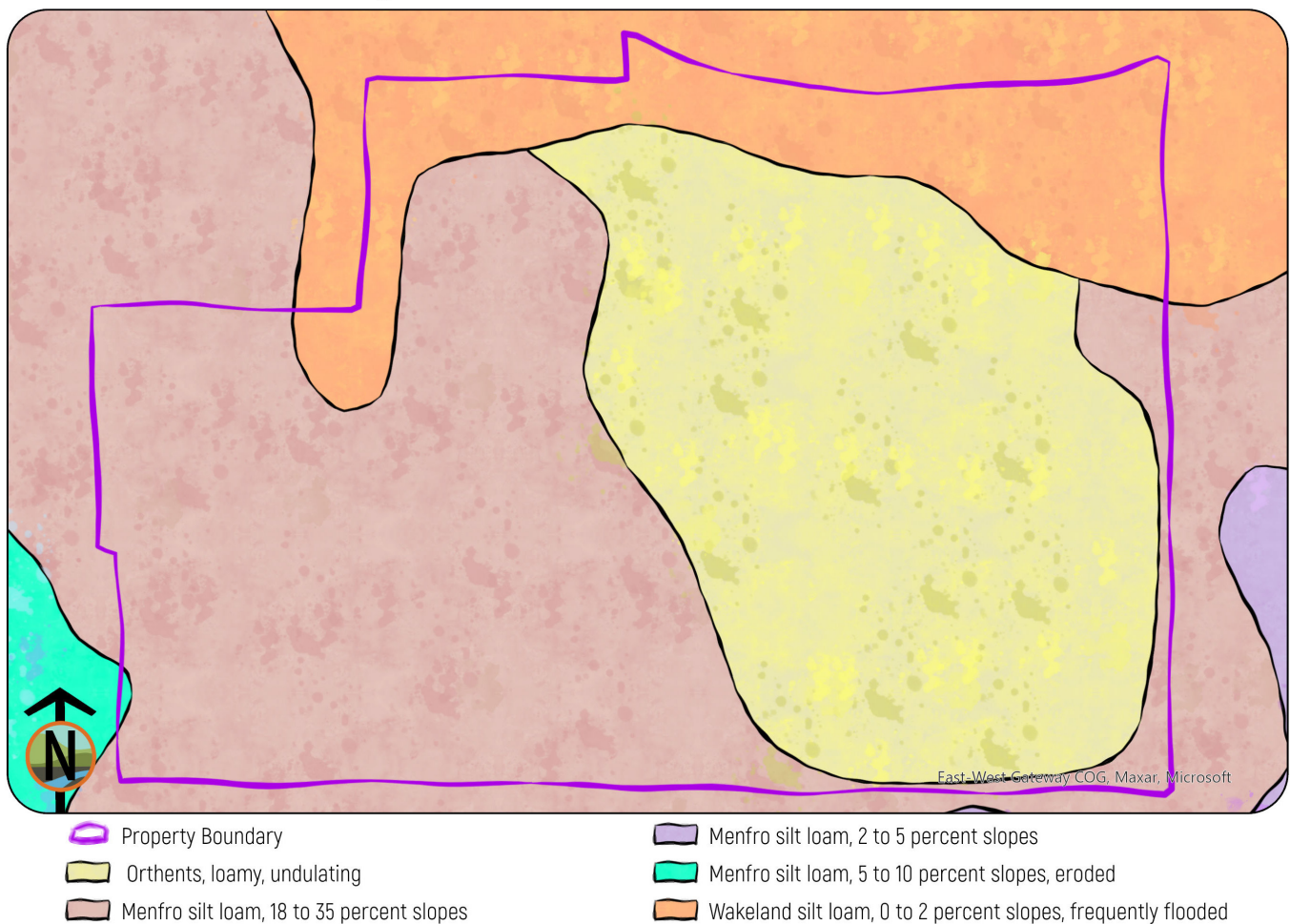


Figure 4: Collinsville Landfill Soils Map

Soils

The soils on the property are classified as Orthents, Menfro, and Wakefield (Figure 4). Orthent soils are typically shallow with low levels of mineral nutrients. Menfro soils are formed from wind blown silt and have varying depths based on slope. Wakefield soils are formed from silty alluvial soils and are found near streams. Menfro and Wakefield soils typically do not require soil amendments to produce vegetation. On the other hand, Orthents soils will likely require soil amendments to grow vigorous plants. The Orthents soils that overlay the landfill cap were likely imported from other sites and soil nutrients are unknown.

The clay clasp of the retired landfill is located 3-9 feet below surface soils. The root systems of native plants will not penetrate the clay cap, but precaution should be taken when using heavy equipment on the landfill cap to prevent non-compliance with EPA regulations.

For implementation of this plan, additional soil will be brought to the site from the future Lebanon Road project. The soil will be spread evenly at one foot in depth across the capped area of the landfill. This soil will likely lack nutrients and should be treated similarly to the Orthents soils.

Vegetation

The waste disposal area is currently planted in cool season grasses. The area between the boundary of the waste disposal area and creeks and the unnamed creek is also planted in cool season grasses. These grasses have a low percentage of “weedy” species growing. They are mowed twice annually to prevent the growth of woody vegetation and the accumulation of thatch. The field on the west side of the property, outside of the waste disposal area, is also planted in cool season grasses and mowed twice annually but contains a higher percentage of native and non-native weedy species.

Mature trees are growing along the streams. The trees, including sycamore, box elder, maples, walnuts, elms, and oaks, are native and typical to our ecosystem. An understory of non-native shrubs and vines is growing beneath the tree canopy. Some weedy perennials are persisting under the canopy of the non-native shrubs and vines despite the low light. Larger forested areas are located in the northeast corner, along the southern border, and along the west border of the property. The existing trees, understory shrubs, and herbaceous ground cover are similar to the edges of the creek.

A close-up photograph of several pink coneflowers with bright orange-brown centers, growing in a field. The flowers are in various stages of bloom, and their green leaves are visible in the background.

The Landfill: A Resilient Future

The vision and goals, and objectives work together to ensure the plan meets the City's current and future use for the property as well as meet any requirements.

Project Vision

The long-term maintenance of vegetation on capped landfills can require low levels of municipal resources while benefiting local ecosystems. Converting the existing vegetation at the Collinsville Landfill to native species will help achieve both of these principles. Further, the habitat created in this project will encourage the return of wildlife species for local residents to enjoy. A green, yet barren, field will become a field dappled with the colors of blooming wildflowers and buzzing with life. The City of Collinsville will be able to showcase this project as an example to other agencies, municipalities, and organizations on how municipal management can coexist with ecosystem benefits.

Project Goals & Objectives

The goals of this project are to reduce the cost of managing vegetation on the Collinsville Landfill and provide benefits to local ecosystems. Creating a native prairie ecosystem and tree nursery will have tangible and observable outcomes, such as reduced mowing and increased wildlife activity, achieving both of these goals.

Future municipal projects may use this project as a template for using native vegetation to reduce the cost of long-term maintenance. Further benefits include improving the aesthetics of the site, improving water quality, increasing biodiversity, reducing erosion, and helping to combat the effects of climate change.

A photograph of a native prairie landscape. The foreground is filled with a dense carpet of green grass and small yellow wildflowers. In the background, there are tall, thin stalks of grass and some purple wildflowers, creating a layered effect.

Vision:

The Collinsville Landfill will become a thriving exemplary native landscape benefiting wildlife and the community - encouraging education and enjoyment - while lessening the long-term draw on the City's resources.

COLLINSVILLE LANDFILL

GOAL 1

Reduce the cost of managing vegetation at the Collinsville Landfill site.

Objective 1.1: Plant a tall grass prairie typical to the region.

Objective 1.2: Manage prairie with annual high mowing during establishment.

Objective 1.3: Use prescribed fire to manage the prairie and concurrently train Collinsville Fire Department on wildland firefighting techniques.

GOAL 2

Create a city tree nursery to produce trees and shrubs for other projects in the City of Collinsville.

Objective 2.1: Plant locally-sourced native trees and shrubs.

Objective 2.2: Annually mow between tree rows to improve growth and survival rate of native trees and shrubs.

Objective 2.3: Relocate trees and shrubs to other projects in the City of Collinsville.

Objective 2.4: Develop a propagation program with training partner(s) and greenhouse(s) at high school and ecology programs/clubs.

GOAL 3

Create a unique addition to the city's public spaces while revitalizing and maintaining it with nature-based solutions.

Objective 3.1: Train city staff and volunteers to collect seed from native prairie plants for use in other projects and sites.

Objective 3.2: Create an interpretive walking trail for public use.

Objective 3.3: Annually hay the prairie planting to provide feed for livestock at Willoughby Heritage Farm.



The Collinsville Landfill:

Creating a Biodiverse Community Asset

1 Landfill Field Unit

Opportunities

- Convert cool-season grasses to native prairie vegetation for pollinator habitat, haying, and education.
- Reduce the amount of time spent mowing through different species and various planting zones. Collect seed.
- Allow Collinsville Fire Department to conduct prescribed burn as training.
- Add a shed for storage of equipment and storage. Consider murals as art.

Challenges

- Must maintain access to the above ground and below ground landfill infrastructure. Map and mark existing infrastructure.
- Maintain service road and pump houses.
- Mowing will be temporarily required to prevent woody species encroachment and the establishment of prairie.
- The surrounding woodland is full of non-native invasive species that will threaten the success of a prairie planting.
- Strips will have to be mowed around utility poles before prescribed burning.
- Slopes will have to be monitored for signs of erosion.
- Addition of Lebanon Rd. project soil requires later seeding.
- Specialized equipment for spraying and planting will have to be purchased, rented, or provided by contractors.
- Mine tailings along service road could damage equipment.

2 West Field Unit

Opportunities

- Consider initially using a cover crop.
- Create biodiverse tree nursery.
- Use native trees for other city projects.
- Include native shrubs.
- Develop training, mentor, and volunteer programs.
- Create interpretive walking trail

Challenges

- Deer browse will threaten the success of tree establishment.
- Additional costs will be incurred to protect trees from deer browse.
- Planted trees will have to be monitored yearly and damaged or lost trees will have to be replaced.
- Mowing will be required between rows of trees to reduce competition from weeds.
- Depending on the size of trees planted, it may take several years for a tree to be the correct size for other city projects.
- Pruning may be required to promote desirable growth forms.
- The surrounding woodland is full of non-native invasive species that will threaten the success of a tree nursery.
- Rabbits may browse on the bark of small trees during winter.
- Maintain access for large equipment to dig and move trees.



3 Stream Corridor Unit

Opportunities

- Reduce erosion through BMPs.
- Re-establish native vegetation.
- Construct riffles and pools as best management practices
- Preserve and enhance waterfall.
- Support initiatives in Canteen Cahokia Creek Watershed Plan.
- Stabilize streambank s. Add habitat
- Maintain access to unit 2.

Challenges

- Invasive species need to be removed to allow the establishment of native species that will anchor the soil.
- Non-native vines include Japanese honeysuckle, winter creeper, and oriental bittersweet.
- Bush honeysuckle dominates the understory. Autumn olive is present on the property but was not observed along the creek.
- Non-native invasive herbaceous plants observed include sericea lespedeza, beef steak plant, and non-native thistle.
- A qualified engineer will be required to design erosion controls.
- Stone toes protection at the base of the banks.
- Riffle pool complexes to increase water depths during normal flow periods and reduce water velocities.

4 Woodland Unit

Opportunities

- Remove invasive species.
- Improve health of forest stand.
- Re-establish native shrubs and wildflowers.
- Propagate and collect seed.
- Incorporate interpretive signs.
- Increase and maintain biodiversity.
- Develop a looped walking trail.

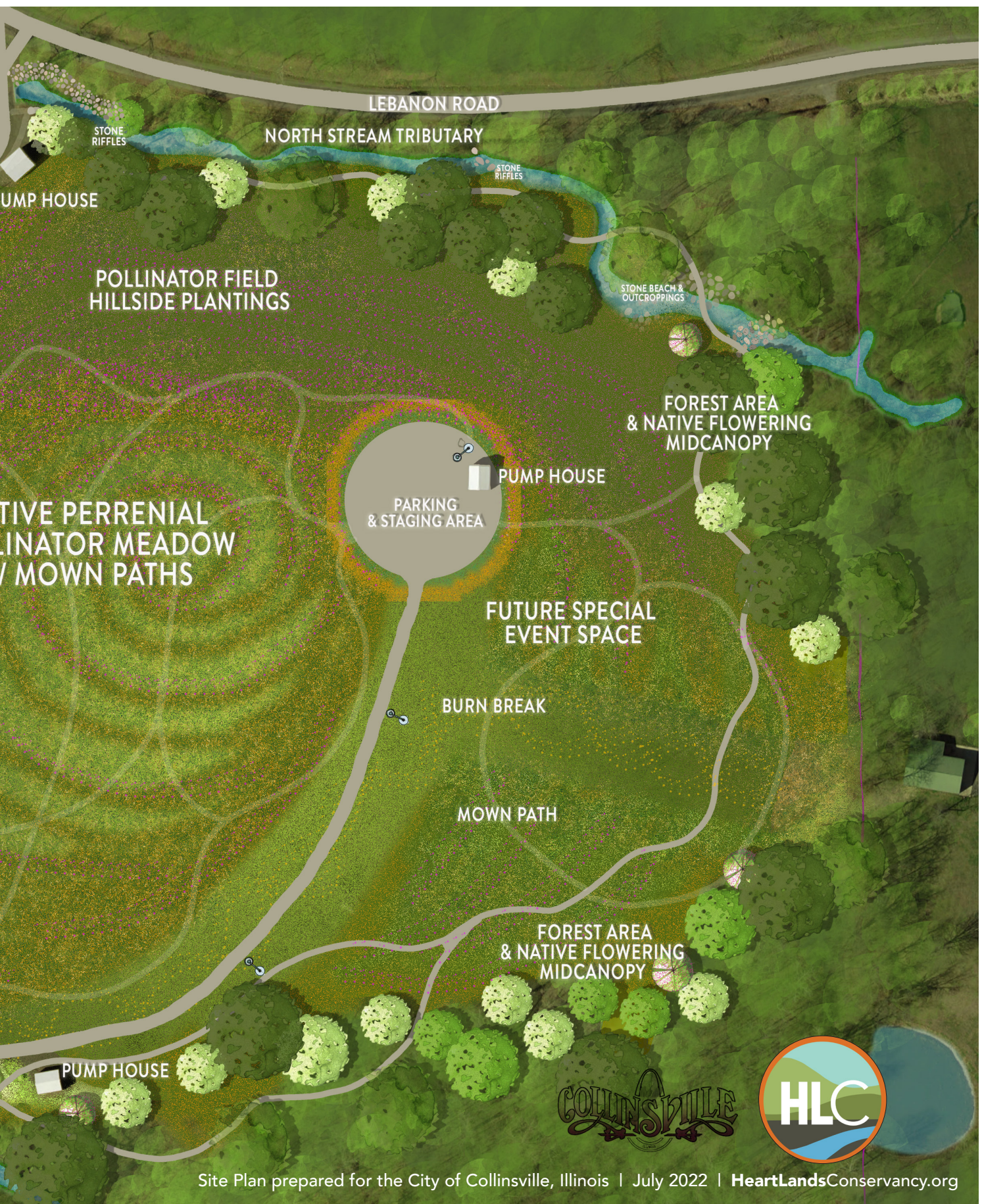
Challenges

- Bush honeysuckle dominates the understory of wooded areas preventing the re-establishment of native shrubs and wildflowers.
- Non-native vines such as winter creeper, Japanese honeysuckle, and oriental bittersweet threaten the health of canopy trees.
- Non-native shrubs and vines can be removed by ecological contractors/professionals or trained volunteers and staff.
- Debris from non-native shrubs and vines may facilitate the re-invasion of non-native shrubs and vines.
- Removal of non-native shrubs and vines will temporarily increase visibility into the property.

The Collinsville Landfill:

Creating a Biodiverse Community Asset





Site Plan prepared for the City of Collinsville, Illinois | July 2022 | HeartLandsConservancy.org

The Action Plan

Management Units

The landfill site is organized into multiple management units (Figure 5). Management units designate the specific locations and needs of different parts of the property.

The Management Units:

- 1 | Landfill Field - Pollinator Meadow
- 2 | West Field - City Tree Nursery
- 3 | Stream Corridor - Stable Banks & Clean Water
- 4 | WoodLand - Healthy Forest

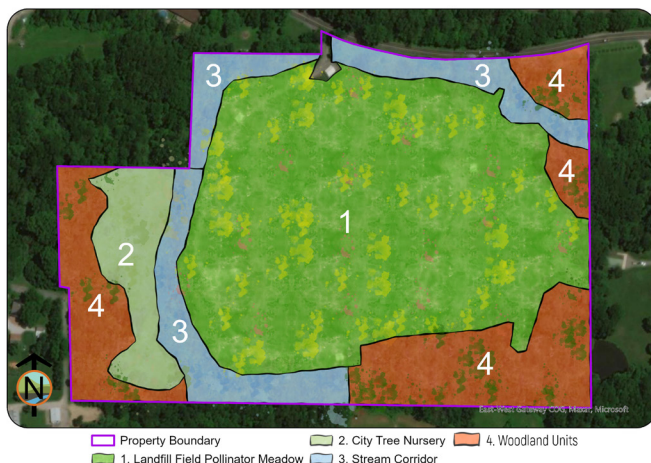


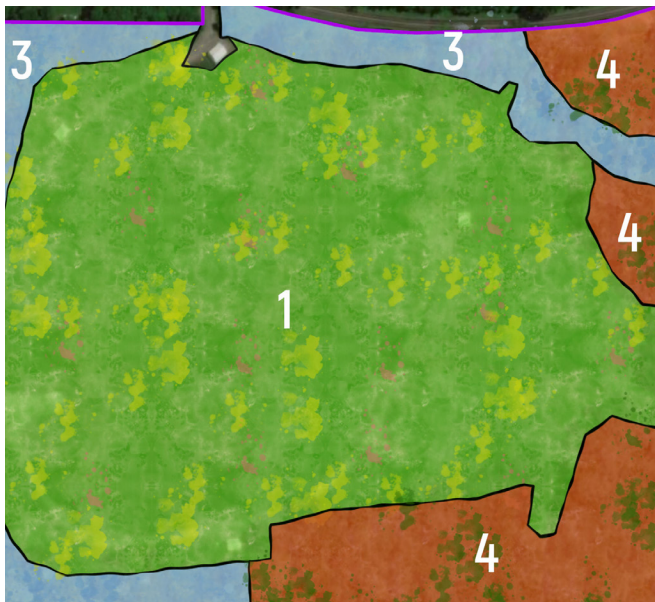
Figure 5: Collinsville Management Units

Benefits

Planting native prairie species on the landfill cap will reduce time mowing grass and repairing erosion issues. After the prairie is established, mowing, light disking, haying, and/or prescribed burning on two to five year intervals will prevent woody species encroachment and facilitate prairie species seed germination. Native prairie species develop complex root systems that will anchor soils and reduce erosion issues. **The roots of native plants do not have the vigor to penetrate the clay cap of the landfill, instead the roots will grow horizontally if or when they reach the clay cap.**

The low-lying section of the property will be converted into a nursery for native trees and shrubs. The nursery will allow small, low-cost trees and shrubs to increase their size in both above and below ground biomass. This low-cost, low-maintenance nursery will provide trees for Public Works and Parks Departments' projects throughout the City of Collinsville.





1 | Landfill Field - Pollinator Meadow

The Landfill Field is located above the landfill cap and includes the open areas around the periphery of the landfill cap (Figure 5). The service road, pump houses, and utility poles and lines fall within the Landfill Field. The Landfill Field will be converted from cool-season grasses to a native upland prairie - a pollinator meadow.

Implementation Action Plan

The recommended tasks are outlined in the order in which to complete them. See Table 1 and 2 for further information. **Table 1** contains detailed information on seed mixes to use. Table 2 summarizes the timeline, actions, and objectives for installing a prairie planting on the Landfill Field Pollinator Meadow.

Year 1 and 2

Task 1: Mark Infrastructure

Mark infrastructure pertinent to the current and past operations of the landfill. Use previous documents to locate and verify the infrastructure locations. At these locations, drive an eight foot T post into the ground at a depth of two to two-and-a-half feet, leaving five-and-a-half to six feet of T post above the surface. Take special consideration to not penetrate or damage any below ground infrastructure or the landfill cap. The tops of T posts should be painted white or orange to increase visibility among the future tall grass prairie species and to prevent future mowing or prescribed burning from damaging above or below ground infrastructure. The less visible points and infrastructure, such as roads and buildings, should be added to project maps.

Task 2: Prepare the Planting Area

Eliminate existing vegetation to prepare the unit for seeding. Cool season grasses can persist and reduce the quality of a prairie planting if they are not effectively eliminated before planting. The termination of the cool season grasses should begin the year before the prairie is planted.

Task 2a: From May through August of Year 1, mow cool season grasses at a height of six inches at intervals that will limit the production of seeds. Mowing can begin as soon as the grasses begin to flower in late spring/early summer and additional mowing may be required during the summer months to suppress seed production.

Task 2b: In mid to early September of Year 1, mow the unit at a maximum height of six inches. This mowing will encourage the cool season grasses to produce fresh growth that will readily uptake herbicides.

Task 2c: In mid October of Year 1, apply a broad-spectrum herbicide such as glyphosate (Trade name Roundup Pro or equivalent) . Application should be performed by a licensed and experienced herbicide operator with a boom sprayer (recommended). Spraying should take place when weather conditions will promote the uptake of herbicide and prevent the drifting of herbicide onto non-target vegetation or into streams. The results from the herbicide application will be observable in seven to 14 days.

Task 2d: Leave terminated vegetation standing over the winter months to protect soils from erosion.

Task 2e: In late March of Year 2, remove terminated vegetation by mowing or prescribed burning.

Task 2f: After mowing or burning in the spring of Year 2, cool season grasses may sprout from remnant seed or resprout from remaining root stock. An additional application of broad spectrum herbicide is recommended to terminate the remaining cool season grasses.

Alternative to Task 2: Soil Addition

If soil from the Lebanon Road project is added to the landfill cap at a depth of one foot, the herbicide treatments to terminate cool season grasses will not be necessary. Instead, soil testing should be performed to determine if the soil needs to be amended to facilitate the establishment of cover crops and prairie species. Further, weedy native and non-native species will quickly become established on the exposed soil. Weeds should be identified and eliminated as quickly as possible using a combination of mowing and spraying. Seeding with prairie species is recommended from November through April. If the addition of soil is completed outside of this window, a cover crop should be planted to stabilize the soil and reduce the establishment of weedy species.



Figure 6: Planting Zones / Seeding Plan for Landfill Field

Task 3: Test the Soil

Perform a soil test to identify any deficiencies in soil nutrients. Soils should be amended by spreading nutrients during planting at levels determined by the results of the soil test. Soil tests should be performed at labs certified by the Agricultural Laboratory Testing Association.

Task 4: Plant the Prairie

Plant the prairie seed and cover crop immediately after the second application of herbicide or the addition of soil using a no till drill or other specialized prairie seed farm implements. Operators of farming implements should be informed about the presence of mine tailings along the service road. The seed mix can vary based on desired outcomes and availability of funding. Figure 6 recommends a targeted seeding that takes into consideration the soil moisture, slopes, and future management. Using a variety of seed mixes will improve the establishment of vegetation and reduce future management costs. Table 1 lists seed mixes, seed suppliers, and cost estimates (cost will vary from year to year) for each seeding area. Seed mix suppliers (see Key Contacts) can customize seed mixes to eliminate species that could be toxic to livestock, but customization comes with increased cost. Haying can be performed selectively based on the species in the seed mixes. For example, if a clover heavy seed mix is

used to plant the burn break, the entirety of the burn break can be hayed while leaving other zones standing. To prevent erosion and facilitate the establishment of the prairie, a cover crop should be planted alongside the prairie seed.

Task 5: Monitor for Erosion and Weeds

After planting the prairie in Year 2, monitor monthly after rain events to identify erosion and non-native weedy species while the prairie vegetation is developing. Repair erosion and remove weeds with a combination of mechanical and chemical methods. Typical problematic species are thistles, sericea lespedeza, and Johnson grass.

Task 6: Erosion Control

Install silt fencing to prevent soil from running off the landfill cap. Silt fencing can be installed prior to planting in areas of known erosion or after erosion is identified during monitoring.

Task 7: Maintenance Mowing

Mow for maintenance in July or early August of Year 2. Annual and perennial native weedy species will emerge from the exposed soils. Mowing at a height of 8 - 12 inches when the vegetation reaches a height of 18 inches will suppress the growth and seed development of weedy species while allowing more sunlight to reach the planted species allowing them to thrive.

Task 8: Let Prairie Grow

During Year 2, many planted species will begin to become established. Some fast growing species will flower, while other species will flower in subsequent years. Leave vegetation standing at the end of Year 2 to anchor soils and provide habitat for wildlife.

Year 3

Task 9: Maintenance Mowing

During mid March to mid April of the Year 3, mow standing vegetation at a height of 6 - 8 inches. This will allow more prairie seed to germinate while the root systems of established vegetation anchor soils.

Task 10: Monitoring

For the remainder of the Year 3, monitor for erosion and non-native weedy species, trees, shrubs, and vines. Erosion issues should be repaired and selective mowing and/or herbicide treatments should be performed to prevent the establishment of non-native herbaceous species, trees, shrubs, and vines.

Task 11: Evaluate for Fire

During the fall of Year 3, a prescribed fire professional can evaluate if a prescribed burn is recommended on the site. The evaluation should include an assessment of the amount of fuel available for a prescribed fire and any potential hazards. Upon recommendations, burn breaks can be established during the winter months.

Year 4

Task 12: Construct Burn Breaks

Install burn breaks around the perimeter of burn units identified by a prescribed fire professional. Mow, rake, leaf blow, lightly disc, or combine these methods to reduce the height of fuels (standing vegetation) and protect infrastructure (pump houses, utility poles, etc.). Roads and streams are natural barriers to fire that can be improved/widened using the previously mentioned methods.

Task 13: Prescribed Burn

Perform a prescribed burn during March of year 4 upon the recommendation of a prescribed fire professional. Proper equipment, training, and permits will be required to successfully perform a prescribed burn.

Year 5+

As the prairie continues to develop, the following tasks should continue:

- Monitoring for erosion and weeds should continue but less frequently.
- Mowing, haying, and burning should be performed once every 1 - 3 years to prevent the establishment of woody vegetation.
- To increase the abundance and diversity of native prairie vegetation, a secondary seeding can be performed in years 5 to 8 after the initial planting.





Table 1: List of seed mixes available to plant in planting zones described in Figure 6.

Seeding Area	Supplier	Seed Mix Name	Cost Estimate	Notes
Burn Break	Pheasants Forever	IL Wildlife Firebreak 2022	\$36/acre	This mix is designed to provide green firebreaks, great brood cover, and doubles as a great food plot for deer and turkey! This mix (1/2 rate) also can be used to meet the FSA / NRCS 327 Conservation Cover Forb Only Inter-seeding practice in introduced stands (use 1/2 acre of mix for each 1 acre of project). Updated January 2022. Includes (PLS#s): Alfalfa (VNS) (1), Alsike Clover (0.5), Crimson Clover (3), Ladino Clover (0.5), Red Clover (1), Annual Lespedeza (1).
Burn Break	Millborn Seeds	IL Firebreak	\$25/acre	Alfalfa, alsike clover, ladino white clover, crimson clover
Erosion Control Grass Seed Mix	Pureair Natives	Erosion Control Grass Seed Mix	\$35.00 - \$685.00/acre	This native prairie grass seed mix is designed to manage erosion by literally getting to the root of the problem. With their extensive root systems, grasses act as a natural erosion control blanket by creating the infrastructure for healthy, stable soil while also allowing water to flow over the landscape rather than carrying it away. For this reason, this plant seeds mix contains a high percentage of prairie grass and sedge, in addition to wildflower seeds.
Sedge Meadow	Pureair Natives	Sedge Meadow	\$50.00 - \$675.00/acre	Love the look of our low profile prairie wildflowers blend, but find you have soil on the soggy side? No worries, this wildflower seeds blend was created with you in mind. In addition to species featured in the low profile blend, the sedge meadow blend contains shorter forbs that prefer richer soils, as well as some of our favorite members of the Carex genus. Composed of about 50% grass and sedge, this prairie wildflowers seed mix will simultaneously help stabilize the soil and beautify marshy environments.
Sedge Meadow	Shooting Star native Seeds	IL CP2 Wet Mix	Must request quote for pricing	Request a price quote for this mix by contacting info@shootingstarnativeseed.com or (507) 498-3944. Substitutions may be necessary based on availability at the time of order.

Seeding Area	Supplier	Seed Mix Name	Cost Estimate	Notes
Sedge Meadow	Pheasants Forever	IL CRP Wet 2022	\$95.00/acre	This mix of 29 regionally appropriate native grass and wildflower species meets and exceeds the USDA FSA / NRCS 327/420 standard for the CRP program and CP2, CP23/23A, CP33, CP4D, CP38 (SAFE) practices and is appropriate for wet to wet-mesic. Click on the PDF below to view this mix in the IL Seed calculator. Updated January 2022.
Tall Grass Prairie	Pheasants Forever	IL Basic Pollinator 2022	\$137.00 / acre	This mix of 36 regionally appropriate native grass and wildflower species meets and exceeds the USDA FSA / NRCS 327/420 standard for the CRP program CP42 pollinator practice and is appropriate for mesic to dry-mesic sites. Click on the PDF below to view the species and rates in the Illinois Seed Calculator. Updated January 2022. Includes (#s/ac): Leadplant (0.015), Common Milkweed (0.031), Butterfly Milkweed (0.02), Canada Milkvetch (0.01), Blue Wild Indigo (0.01), False Aster (0.01), Sideoats Grama (0.28), Partridge Pea (0.26), Mist Flower (0.003), Lanceleaf Coreopsis (0.15), White Prairie Clover (0.05), Purple Prairie Clover (0.2), Illinois Bundleflower (0.26), Purple Coneflower (0.25), False Sunflower (0.1), Alum Root (0.002), Marsh Blazingstar (0.01), Wild Bergamot (0.04), Stiff Goldenrod (0.02), Foxglove BeRoadtongue (0.015), Prairie Cinquefoil (0.007), Narrowleaf Mountain Mint (0.007), Mountain Mint (0.001), Grayheaded Coneflower (0.05), Black-eyed Susan (0.063), Brown-eyed Susan (0.05), Little Bluestem (0.45), Gray Goldenrod (0.005), Sand Dropseed (0.01), Smooth Blue Aster (0.002), Calico Aster (0.003), Ohio Spiderwort (0.001), Crimson Clover (0.2), Hoary Vervain (0.03), Culver's Root (0.001), Golden Alexander (0.07).
Pollinator Mix	Millborn Seeds	IL CP42 (D-M)	\$125/acre	NRCS approved CP42 Mix.
City Tree Nursery	Pheasants Forever	IL CRP Shortgrass 2022	\$91/acre	This mix of 32 regionally appropriate native grass and wildflower species meets and exceeds the USDA FSA / NRCS 327/420 standard for the CRP program and CP2, CP23/23A, CP33, CP4D, CP38 (SAFE) practices and is appropriate for mesic to dry-mesic sites. Click on the below PDF to view the species and rates in the Illinois Seed Calculator. Updated January 2022. Includes (#s/ac): Leadplant (0.015), Common Milkweed (0.02), Butterfly Milkweed (0.01), Canada Milkvetch (0.02), Sideoats Grama (0.5), Partridge Pea (0.15), Lanceleaf
				Coreopsis (0.2), White Prairie Clover (0.01), Purple Prairie Clover (0.03), Illinois Bundleflower (0.1), Showy Tick-trefoil (0.1), Purple Coneflower (0.1), Marsh Blazingstar (0.01), Wild Bergamot (0.03), Stiff Goldenrod (0.01), Foxglove BeRoadtongue (0.005), Prairie Cinquefoil (0.01), Narrowleaf Mountain Mint (0.01), Mountain Mint (0.001), Grayheaded Coneflower (0.01), Black-eyed Susan (0.063), Brown-eyed Susan (0.01), Little Bluestem (0.75), Gray Goldenrod (0.003), Sand Dropseed (0.03), Smooth Blue Aster (0.002), Calico Aster (0.005), New England Aster (0.002), Ohio Spiderwort (0.001), Hoary Vervain (0.01), Culver's Root (0.001), Golden Alexander (0.02).

Table 2: Implementation guide to establish a prairie (Pollinator Meadow) on the Landfill Field Unit

Year 1	When	Action	Objective	Notes
Task 1	Start of project	Mark pertinent infrastructure	Prevent damage to landfill	Identify location and mark infrastructure that could be damaged during implementation or operation and maintenance.
Task 2a	Late May/Early June	Mow at a height of 6 inches	Prepare the planting area	Timing of mowing may vary because grasses will grow at different rates with varying sunlight, moisture, and temperature conditions
Task 2b	September	Mow at a height of 6 inches	Prepare the planting area	Prevent the formation of seed and facilitate fresh growth. Timing of mowing may vary because grasses will grow at different rates with varying sunlight, moisture, and temperature conditions
Task 2c	October	Spray with 2% Roundup Pro Concentrate (2.5 oz. Roundup Pro Concentrate/gallon of solution)	Prepare the planting area	Terminate existing stand of cool season grasses. For best results, spraying should be performed on a sunny day when the temperature is greater than 60 degrees fahrenheit and winds are less than 10 mph. Ideal wind directions will carry the herbicide away from the streams on the property
Task 2d	November-December	Leave dead vegetation standing	Prepare the planting area	Anchor soil over winter months. Monitor for erosion issues after major rain events
Task 3	October - December	Test soil	Prepare the planting area	The highly disturbed soil of the landfill should be tested to identify any soil amendments that will facilitate the establishment of prairie vegetation

Year 2	When	Action	Objective	Notes
Task 2d	January	Leave dead vegetation standing	Prepare the planting area	Anchor soil over winter months. Monitor for erosion issues after major rain events
Task 2e	Early March	Remove dead vegetation by mowing or prescribed burning	Prepare the planting area	Expose mineral earth to sunlight and allow for remnant cool season grass or weedy species to germinate. Monitor for erosion issues after major rain events. Mark below ground infrastructure and/or hazards to planting equipment.
Task 2f	Late March	Spray with 2% Roundup Pro Concentrate (2.5 oz. Roundup Pro Concentrate)	Prepare the planting area	Terminate germinating cool season grass and weed seeds. Monitor for erosion issues after major rain events
Task 2(alt)		Spread dirt at minimum depth of 1 foot across the entire landfill unit	Prepare the planting area	Soil from the Lebanon Road project will terminate existing vegetation if spread at a thickness of 1 foot across the entirety of the unit. Spot spraying and mowing may be required to eliminate weeds and cool season grasses that sprout from the seed bank
Task 4	April	Plant prairie seed mix and cover crop with a no till drill or other recommended farming implement for prairie seed planting	Plant the Prairie	Recommended cover crop: annual rye grass and oats. Recommended prairie species: little bluestem, canada rye, rattlesnake master, butterfly weed, common milkweed, rosin weed, oxeye sunflower, wild quinine, aromatic aster, heath aster, coreopsis, prairie blazing star, grey headed coneflower, black-eyed Susan, wild senna, prairie dock, rigid goldenrod, New England aster, wild bergamot, white wild indigo, foxglove beardtongue, golden alexander, ohio spiderwort,
Task 5	April - December	Monitor for erosion and weeds	Prevent erosion and weeds	After planting the prairie, monitor monthly after rain events to identify erosion and non-native weedy species while the prairie vegetation is developing. Typical problematic species are thistles, sericea lespedeza, and Johnson grass.

Task 6	June - September	Install silt fence	Stop erosion	Install silt fencing in areas where water is cutting channels into the soil and/or soil is slumping down slopes
Task 7	July - early August	Mow at a height of 8 -12 inches	Maintenance Mowing	Reduce competition and seed production from weedy species. Mow when vegetation reaches 18 inches in height. Weedy annual grasses and forbs will be suppressed allowing the slower developing prairie species to compete
Task 8	October- December	Monitor for blooming prairie species	Let Prairie grow	After the first growing season, many planted species will begin to become established. Some fast growing species will flower, while other species will flower in subsequent years. Leave vegetation standing after the first growing season to anchor soils and provide habitat for wildlife.

Year 3	When	Action	Objective	Notes
Task 9	Mid February/Mid March	Mow at height of 6 inches	Maintenance Mowing	Remove standing vegetation to allow continued germination of prairie seed
Task 10	May - September	Monitor for erosion issues and the establishment of non-native herbaceous species, trees, shrubs, and vines	Monitoring	Erosion issues should be repaired and selective mowing and/or herbicide treatments should be performed to prevent the establishment of non-native herbaceous species, trees, shrubs, and vines.
Task 11	October - December	Evaluate the need for prescribed burning	Determine if the site has sufficient fuels to carry a prescribed fire	A contiguous stand of prairie grasses and wildflowers will allow a prescribed burn to carry through the prairie planting. Also, the contiguous stand will have sufficient root development to anchor soils during the period between the application of prescribed fire and the beginning of the next growing season
Year 4	When	Action	Objective	Notes
Task 12	January - March	Install burn breaks	Create a barrier that will prevent a prescribed fire from carrying to unintended areas	Existing features, such as streams and roads, can serve as a burn break. When existing features are not present, an area of 45 - 60 feet will need to be mowed to prevent damage to pump houses and power lines.
Task 13	Mid March/Mid April	Conduct a prescribed burn	Remove thatch and facilitate germination of prairie species	Proper equipment, training, and permits will be required to successfully execute a prescribed burn.



2 | West Field -City Tree Nursery

The City Tree Nursery (Figure 5) is an open area located on the west side of the property. The unit can be accessed from the service road via a land bridge that crosses the West Stream. The City Tree Nursery is largely flat near the West Stream but has increasingly steep slopes on the west and south sides of the unit. The current vegetation is cool season grass intermixed with native weedy species. This unit will be converted into an tree nursery for the City to use for plant materials for other City properties and projects.

Implementation Action Plan

The tasks are outlined in this narrative. Resources are listed in the table and may reference other unit sections in this plan.

Table 3 provides quantities and species of trees, small trees, and shrubs for the unit's planting zones.

Table 4 summarizes the timeline, actions, and objectives for installing, operating, and maintaining the City Tree Nursery.

Task 1: Prepare the Planting Area

Terminate the cool season grasses that currently exist. Use the same methods from the Landfill Field Pollinator Meadow plan (Tasks 2a - 2f).

Task 2: Plant Pollinator Patch: a Short Grass Prairie

In late March or April, plant a short grass prairie seed mix (Table 1) with cover crops to reduce weeds and the momentum of water flowing from the surrounding uplands. A pollinator patch is recommended within the City Tree Nursery directly across from the land bridge entering the field and continuing south. The pollinator patch will add the color of native prairie plant flowers and serve as a buffer for water running from the upland

habitat to the south. The O&M for the will be the same as the Landfill Field Pollinator Meadow.

Task 3: Select Tree and Shrub Species

Soil moisture, slope, and light conditions vary considerably across the City Tree Nursery. To improve the success of planted trees and shrubs, the City Tree Nursery is subdivided into 4 planting zones (Figure 7). For example, Planting Zone 1 is flat with moist soils and full sun exposure, while Planting Zone 3 is sloped with well drained soil and partial shade. Table 3 lists recommended tree and shrub species for each individual planting zone. The list is not all inclusive and trees that can tolerate similar conditions can be planted within each planting zone. Bare root seedlings are a cost-effective way to grow trees and shrubs. Bare root seedlings range in size from 12 to 18 inches, but will grow to 4 - 8 feet within a five year period.

Task 4: Space Trees and Shrubs

Use flagging or other marking methods to properly space trees and shrubs prior to planting. Trees and shrubs should be planted in rows. The rows should begin 20 feet from the tree line. Each row should be 20 feet from the next row and each tree should be planted 20 feet apart (Figure 8). These 20 foot intervals will prevent trees and shrubs from competing with one another and allow for maintenance mowing between rows. Further, if the trees and shrubs are not relocated to other project sites, the spacing will allow for the planted trees to transform into a well spaced forest as they reach maturity.

The City Tree Nursery has space to plant 190 to 220 bare root seedlings depending on species selected and availability of funding. Spacing between shrubs can be reduced to 15 feet if the tree rows remain spaced at 20 feet. Rows of trees on the boundaries between planting zones can be planted with species from either planting zone providing flexibility when selecting and sourcing trees and shrubs. Table 3 shows the number of trees that can be planted in each planting zone, but the overall number of trees and shrubs installed should not exceed 220.

Task 5: Plant Trees and Shrubs

Use a tree spade to puncture the soil, and slide the seedling into the separated soil to a depth where the root crown is level to the grade of the soil. Compact soil around the seedling using a boot to anchor the seedling into the soil.

Task 6: Protect Seedlings from Herbivory

The primary disadvantage of bare root seedlings is their susceptibility to herbivory by white-tailed deer and rabbits. Immediately after planting seedlings, slide tree tubes over the top of seedlings making sure the bottom of the tree tube touches the ground. Drive a

stake into the ground next to the tree tube, and anchor the tree tube to the stake with zip ties.

Task 7: Monitor for erosion and weeds

After planting the native ground cover and seedlings, monitor monthly after rain events to identify erosion and non-native weedy species while the prairie vegetation is developing. Typical problematic species are thistles, sericea lespedeza, and Johnson grass. Repair erosion with silt fencing or other techniques, and remove non-native weedy species with a combination mechanical and chemical treatment methods. Reference online resources to identify appropriate methods to remove non-native invasive species.

Task 8: Maintenance Mowing

Mow between rows of trees at a height of 8 - 10 inches up to twice annually to prevent the establishment of undesirable woody vegetation. High mowing will reduce competition from volunteer tree species while allowing native grass and flowering species to persist. The frequency of mowing can be reduced as the native herbaceous species and trees and shrubs become established. The pollinator patch can be managed with the same methods as the Landfill Field - Pollinator Meadow plan.

Task 9: Replace Dead Seedlings

The low-cost of bare root seedlings comes with higher rates of mortality than larger container trees. In August following the planting, inspect the seedlings for survival. An unsuccessful seedling will be devoid of leaves and become rigid. Mark tree tubes with unsuccessful seedlings with flagging tape and note the total the number of seedlings lost. Replace lost seedlings using methods in Tasks 5 and 6. Replacing unsuccessful seedlings and trees and shrubs moved to other city projects will provide varying sizes of trees and shrubs and minimize the cost of replanting in any given year.

Ongoing Operation & Maintenance

As the City Tree Nursery, the following tasks should continue:

- Monitoring for erosion and weeds should continue but less frequently.
- High-mowing between rows should continue annually to biannually to prevent the establishment of volunteer woody species.
- Inspect annually for mortality.
- Replace unsuccessful seedlings or trees and shrubs that have been moved to other city projects.

Costs

The short grass prairie mix is a low-cost (\$91/acre) high-reward option to increase the success of the tree and shrub planting and the function of the ecosystem. The cost to plant one bare root seedling with a tree tube and stake can range from \$5 - \$10 depending on the tree and shrub species and materials selected to protect the trees and shrubs.

"The protection of land is an expression of faith in the future: it is a pact between generations."

*- Mark Benedict &
Edward McMahon
Green Infrastructure*

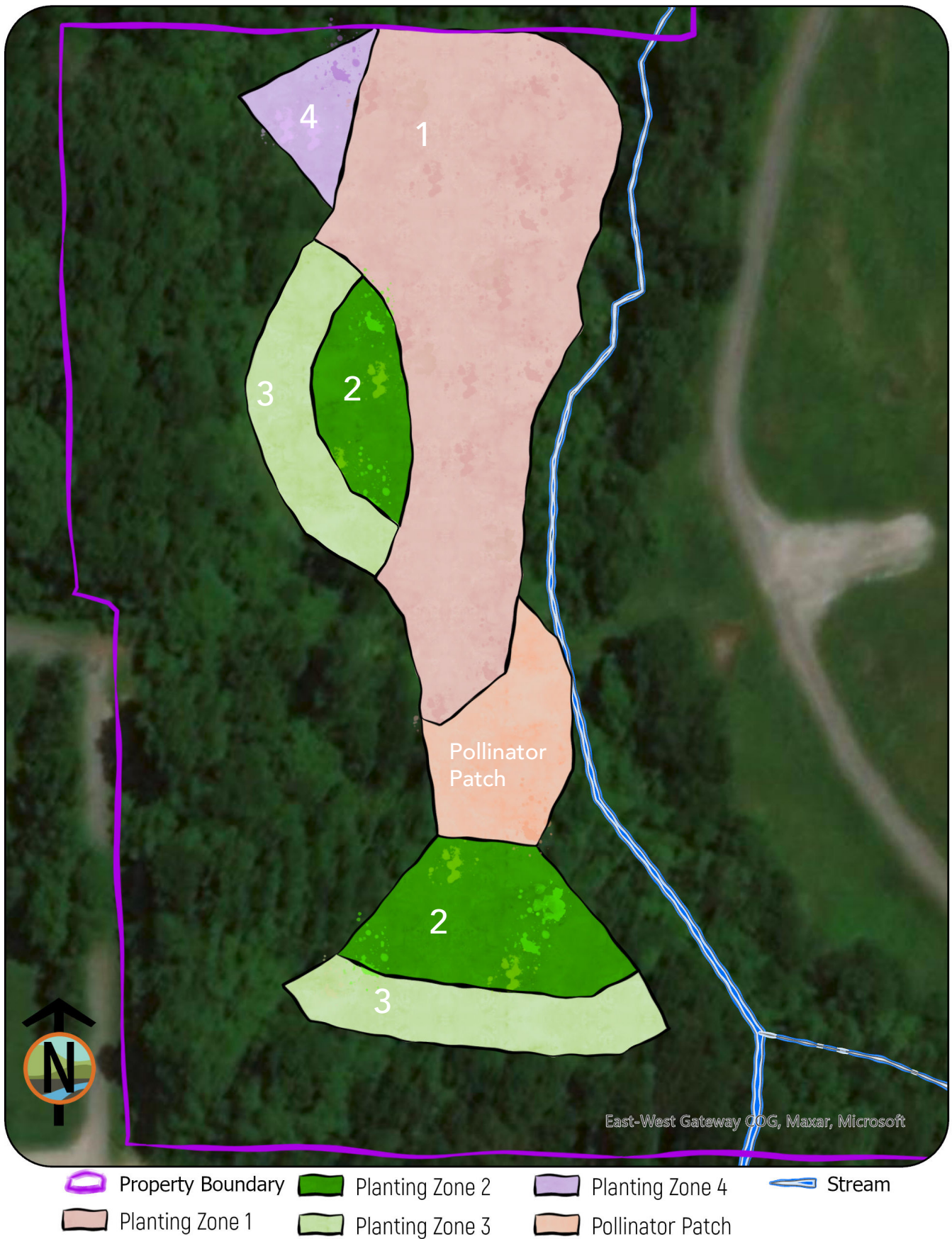
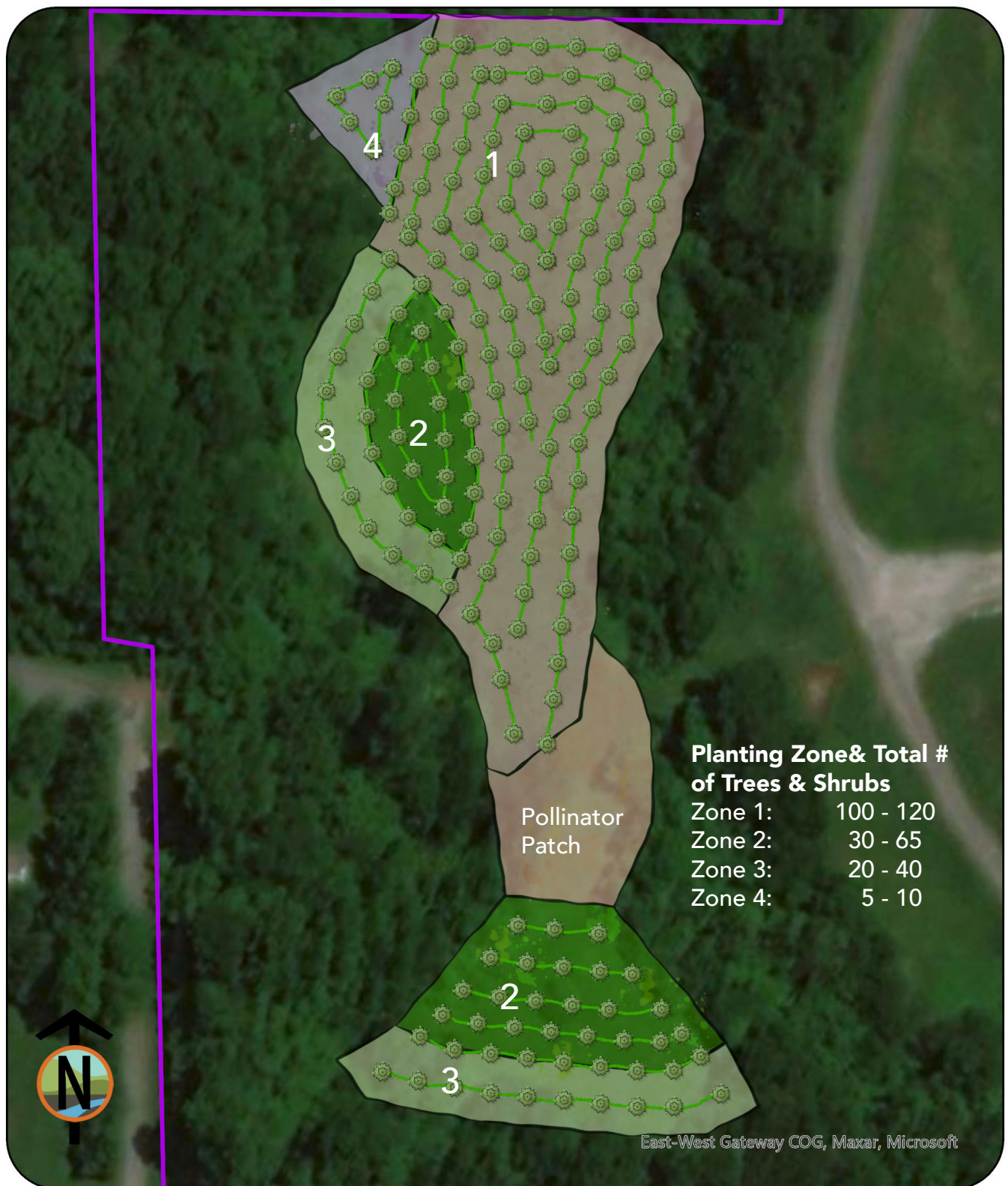


Figure 7: West Field - City Tree Nursery Planting Zones



- Trees and Shrubs
- Planting Zone 1
- Planting Zone 3
- Pollinator Patch
- Tree Nursery Rows
- Planting Zone 2
- Planting Zone 4
- Property Boundary

Figure 8: West Field - City Tree Nursery Planting Plan

Table 3: List of recommended trees and shrubs for the West Field - the City Tree Nursery Unit planting zones in Figure 7.

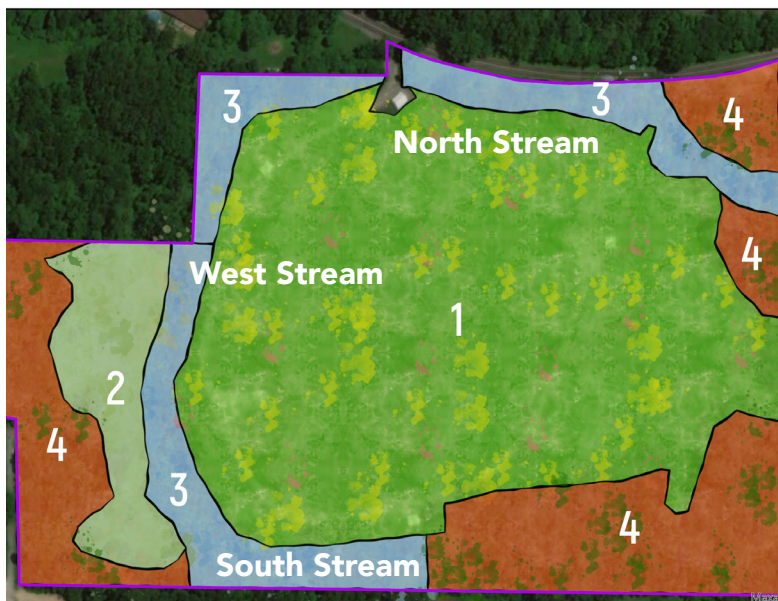
City Tree Nursery Planting Zone 1 Total Number of Trees and Shrubs to select: 100 - 120		
Type	Common Name	Scientific Name
tree	swamp white oak	Quercus bicolor
tree	overcup oak	Quercus lyrata
tree	pin oak	Quercus palustris
tree	bald cypress	Taxodium distichum var. distichum
tree	river birch	Betula nigra
tree	bitternut hickory	Carya cordiformis
tree	shellbark hickory	Carya laciniosa
tree	pecan	carya illinoensis
tree	pignut hickory	carya glabra
tree	mockernut hickory	Carya tomentosa
small tree	flowering dogwood	Cornus florida
small tree	flowering dogwood	Cornus florida f. rubra
tree	Basswood	Tilia americana
shrub	pussy willow	Salix discolor
shrub	American hazelnut	Corylus americana
shrub	eastern wahoo	Euonymus atropurpureus
shrub	common witch hazel	Hamamelis virginiana

City Tree Nursery Planting Zone 2 Total Number of Trees and Shrubs to select: 30 - 65		
Type	Common Name	Scientific Name
tree	white oak	Quercus alba
tree	bur oak	Quercus macrocarpa
tree	chinkapin oak	Quercus muehlenbergii
tree	black oak	Quercus velutina
shrub	wild plum	Prunus americana
shrub	ninebark	physocarpus opulifolius
shrub	blackhaw viburnum	Viburnum prunifolium
City Tree Nursery Planting Zone 3 Total Number of Trees and Shrubs to select: 20 - 40		
Type	Common Name	Scientific Name
shrub	spicebush	Lindera benzoin
shrub	strawberry bush	Euonymus americanus
shrub	smooth hydrangea	hydrangea arborescens
shrub	ninebark	physocarpus opulifolius
shrub	blackhaw viburnum	Viburnum prunifolium
City Tree Nursery Planting Zone 4 Total Number of Trees and Shrubs to select: 5 - 10		
Type	Common Name	Scientific Name
shrub	pussy willow	Salix discolor
shrub	spicebush	Lindera benzoin

Table 4: Implementation guide to establish a prairie in the West Field - City Tree Nursery

Year 1	When	Action	Objective	Notes
Task 1	October - March	Terminate existing vegetation	Prepare the Planting Area	Use the same methods described in Task 2a - 2f in the Landfill Field Pollinator Meadow plan
Year 2	When	Action	Objective	Notes
Task 2	Mid April	Plant short grass prairie seed mix and cover crop with a no till drill or other recommended farming implement for prairie seed planting	Plant short grass prairie	Recommended cover crop: annual rye grass and oats.
Task 3	April - October	Use materials provided in this plan to select and source trees and shrubs	Select tree and shrub species	A total of 190 to 220 trees and shrubs will be planted among four planting zones. Use tables and figures in this plan to guide the tree and shrub selection process
Task 4	Prior to tree and shrub planting	Mark locations where trees and shrubs will be planted	Space trees and shrubs	Before planting, use flags or other marking methods to space tree rows 20 feet from the tree line and other rows. Trees will be planted at 20 foot intervals
Task 5	November to March	Use a tree spade to puncture to plant trees and shrubs.	Plant trees and shrubs	Use a tree spade to puncture the soil, and slide the seedling into the separated soil to a depth where the root crown is level to the grade of the soil. Compact soil around the seedling using a boot to anchor the seedling into the soil.
Task 6	During or immediately after tree and shrub planting	Install tree tubes	Protect seedlings from herbivory	Immediately after planting seedlings, slide tree tubes over the top of seedlings making sure the bottom of the tree tube touches the ground. Drive a stake into the ground next to the tree tube, anchor the tree tube to the stake with zip ties.

Year 1	When	Action	Objective	Notes
Task 7	May to September	Monitor for erosion and weeds	Prevent erosion and weeds	After planting the prairie, trees, and shrubs, monitor monthly after rain events to identify erosion and non-native weedy species while the prairie vegetation is developing. Typical problematic species are thistles, sericea lespedeza, and Johnson grass.
Task 8	June to October	Mow between rows at a height of 8 to 10 inches	Maintenance Mowing	High mowing will reduce competition from volunteer tree species while allowing native grass and flowering species to persist. The frequency of mowing can be reduced as the native herbaceous species and trees and shrubs become established. The pollinator patch can be managed with the same methods as the Landfill Field Pollinator Meadow plan.
Task 9	August	Inspect tree and shrub planting for mortality	Monitor seedling survival	An unsuccessful seedling will be devoid of leaves and become rigid. Mark tree tubes with unsuccessful seedlings with flagging tape and note the total the number of seedlings lost. Replace lost seedlings using methods in Tasks 5 and 6 from November to March.



3 | Stream Corridor - Stable Banks & Clean Water

The stream corridor unit includes the unnamed tributaries of Canteen Creek and a 50-foot buffer on each side of the stream bank. The unnamed streams have intermittent flows and are subdivided into:

- The North Stream that is on the north side of the property;
- The West Stream that runs from south of the property and empties into the North Stream; and
- The South Stream that runs along the south central section of the property and empties into the West Stream.

Implementation Action Plan

The tasks are outlined in this narrative. Additional resources are available in the other unit sections.

Task 1: Funding Sources

Identify cost-share opportunities or grants to implement the above conservation and stream best management practices. Potential funding sources are discussed in the funding section of this document.

Task 2: Invasive Shrub and vine Removal

Remove non-native invasive shrubs and vines, such as bush honeysuckle, autumn olive, winter creeper, and Japanese hops, from stream buffers. Foliar application of herbicides, cutting with chainsaws and brushcutters and immediately treating the stumps with herbicide, grazing with goats, and mowing with fecon mowers with a follow up foliar application of herbicide are methods that will effectively reduce and eliminate non-native invasive shrub species. Recommendations for treatment methods from reputable institutions:

Invasive Species Management Guidelines

- Illinois Nature Preserves Invasive Species Management Guidelines
<https://www2.illinois.gov/dnr/INPC/Pages/INPCManagementGuidelines.aspx>
- University of Illinois Extension: Management of Invasive Plants and Pests of Illinois
https://extension.illinois.edu/sites/default/files/management_of_invasive_plants_and_pests_of_illinois.pdf
- Missouri Department of Conservation: Invasive Plants
<https://mdc.mo.gov/trees-plants/invasive-plants>

Task 3: Reintroduction of Native Species

Reintroduce native woodland species. After removal of invasive trees and vines, some native woodland species will emerge from the existing seed bank. Additional native woodland herbaceous species and shrubs can be planted to accelerate establishment. The deep root systems of native plants and shrubs will anchor soils and slow the movement of water into the streams.

Task 4: Monitor for Erosion and Invasive Species

Annually monitor for erosion and invasive species. Repair minor erosion issues and remove invasive species.

Task 5: Stream Best Management Practices (BMPs)

Consult with a qualified engineer to identify opportunities to install stream BMPs, such as regrading, stone toe protection, and riffle complexes. Significant down cutting and stream bank erosion is present on the North and West Streams. Funding sources identified in Task 1 may be available to provide cost-share for stream BMPs.





Above PC: HeartLands Conservancy - HLC using a site to educate about the importance of water quality and how a watershed works. The participants learn about the water cycle then venture into the site to learn about pollinators, wildlife and the plants that benefit them.

Below PC: Illinois Botanizer. Monitoring sites for species - beneficial and invasive - helps to record progress and maintenance needs. Here Chris Benda is recording species at Brushy Lake.

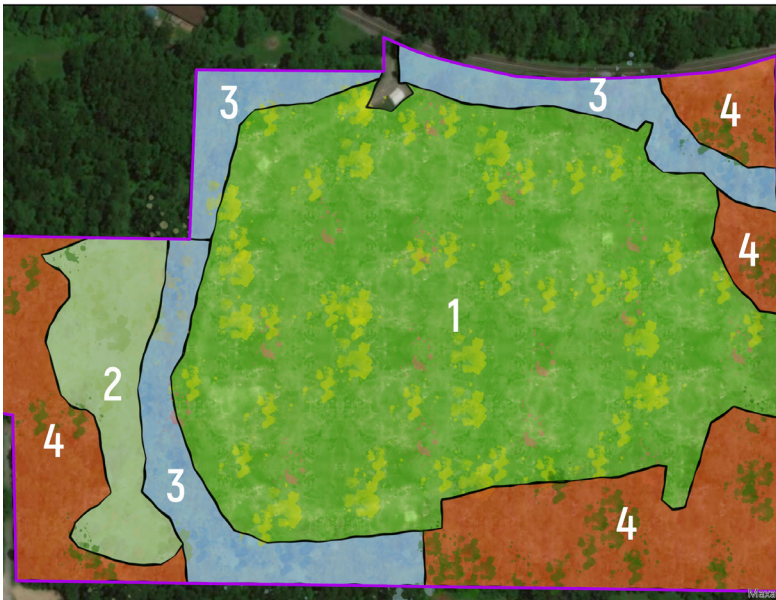




Above PC: HeartLands Conservancy - Highland Silver Lake new wetland area, designed in part by HLC. One of the nicest features of the park is the beautiful waterfall that was created out of existing stones from the area.

Below PC: IEPA - FAA 3191608 – The Woods Creek Stream-bank Stabilization and Restoration project stabilized eroding streambanks on Woods Creek by widening the channel and installing a floodplain shelf, a riparian buffer of native vegetation, stone toe protection, and rock riffle grade control structures.





4 | Woodland - Healthy Forest

The Woodland Unit is located on the west, southeast and northeast sections of the property. This unit contains water-loving tree species, an understory of invasive shrub species, and overly abundant Eastern red cedars on the western side of the property.

The management objective of the Woodland Unit is to reduce surface flow of water by re-establishing a balanced vegetative structure, improve and support a healthy forest.

Bush honeysuckle, autumn olive and multiflora rose dominate the understory. The presence of these non-native invasive shrub species prevents sunlight from reaching the forest floor. Without sunlight, ground vegetation is unable to grow and anchor soils. A combination of mechanical and chemical methods should be used to remove these shrub species. After removal, native species will re-emerge from the seed bank and improve the quality of the woodland units.

Implementation Action Plan

The tasks are outlined in this narrative. Additional resources are available in the other unit sections.

Task 1: Removal of Invasive Shrub Species

Remove non-native invasive shrubs and vines, such as bush honeysuckle and autumn olive, from Healthy Forest unit. Foliar application of herbicides, cutting with chainsaws and brushcutters and immediately treating the stumps with herbicide, grazing with goats, and mowing with fecon mowers with a follow up foliar application of herbicide are methods that will effectively reduce and eliminate non-native invasive shrub species. Recommendations for treatment methods from reputable institutions are available

online and listed in the previous section Stream Corridor Unit 3. Replace native trees where possible.

Alternative : Browsing by goats is an alternative to mechanically or chemically removing invasive shrub species. Goat handlers can identify areas where the method is appropriate and any threats to the goats, such as predation by coyotes. Goats non-selectively graze and should not be used on areas with high densities of desirable species.

Task 2: Monitoring and Follow Up

Monitor annually to identify areas of ineffective removal efforts and/or sprouting non-native shrubs from the seed bank. Perform follow up treatments using the methods discussed above.

Monitor annually and remove other forest invaders, such as garlic mustard, beefsteak plant, and Japanese hops, as they emerge from the seed bank.

Task 3: Long-term Operation & Maintenance

Non-native invasive plant species are readily distributed by animals, the wind, and water among properties in suburban areas. The most cost-effective way to manage invasive species is early detection and removal. Continue monitoring and removing invasive species annually.

Costs, in labor, equipment, and supplies, rise significantly as stands of non-native invasive species increase in size and abundance.

Recruiting and training volunteers to perform conservation practices is a low cost option to monitor and remove invasive species. Beyond the tangible value of invasive species removal, volunteers become ambassadors for nature-based conservation practices in the community.



Above Left & Below PC: The Nature Institute - Invasive species removal. Bush honeysuckle removal.



Above Right PC: HeartLands Conservancy - Invasive species survey and removal: bush honeysuckle Removal, autumn olive, Japanese hops, grapevine, mimosa, tree of heaven, etc.





Funding Strategy

Overview

The funding strategy will serve as a tool for the Village and staff to move forward. This is a dynamic list of resources. The agencies, organizations, and foundations referenced are frequently affected by policy change, economic shifts, and depletion or change in funding sources. Therefore, it is important to investigate each source of funds, the regulations, and the required outcomes prior to seeking the funds.

This section contains:

- Opinion of Probable Cost information
- Funding Opportunities
- Funding Recommendations
- Potential Funding Sources
- Leveraging Resources

Opinion of Costs

The opinions of probable costs shown in the plan narrative and tables were developed by identifying and assigned approximate price ranges. It should be noted that planning-level cost opinions may include an approximate contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Pay item price ranges are based on 2022 dollars and were assigned based on historical cost data. It should be noted that these costs may not adequately consider the widely varying costs associated with the current COVID-19 Pandemic

environment. In addition, materials and labor may be unavailable or unpredictable in the post-Covid era.

The cost opinions do not include land acquisition costs, easement and right-of-way acquisition; permitting, inspection, or construction management; engineering, surveying, geotechnical investigation, environmental documentation, special site remediation, cost escalation, inflation; or the cost for ongoing maintenance. A cost range has been assigned to most items where known or applicable; however, these costs can vary widely depending on the exact details/specifications and nature of the actual work.

The overall cost opinions are intended to be general and used only for planning purposes. The opinion of probable cost is made on the basis of the consultant's professional judgment and experience. The consultant makes no guarantee or warranty, expressed or implied, regarding the ultimate bids or negotiated cost of the work. Construction cost will therefore vary based on the ultimate project scope, actual site conditions/constraints, client's choice of supplies and materials, schedule, and economic conditions at the time of construction.

Over time as the City moves forward in developing landfill improvements, proposed project costs should be re-evaluated with the additional information and requirements. The proposed projects should also be reviewed for cost-effective strategies, such as in-house installation, contractor bid installation

and implementation, etc. As funding allows, the highest-priority management unit projects should be pursued. In the meantime, to understand the magnitude of potential increases, staff may adjust for inflation by using the conversion rates given at www.usinflationcalculator.com.

For specific stormwater management and green infrastructure initiatives along the stream corridor, features may be estimated for an opinion of probable cost through an additional valuable resource: the Green Values National Stormwater Management Calculator, available online at http://greenvalues.cnt.org/national/cost_detail.php. This site includes information on construction costs, maintenance costs, and component lifespan.

Funding Opportunities

To implement the Plan's recommendations, the City may seek to diversify funding sources. There are a variety of funding sources available. Planning for these in the annual budget in replacement of the current maintenance costs will alleviate some burden. The potential to collect seed, propagate, hay feed for the Willoughby Heritage Farm livestock, and house trees for the rest of the city will further offset costs.

Successful implementation of the plan will require strategic targeting and phased implementation of the most critical projects and most urgent improvements balanced with funding.

Funding for projects within this plan can further come from a variety of sources: donations, fundraising, loans, assessments, ordinances, and grants (local, state, and federal agencies), foundations, environmental organizations, and financial entities. For instance, the stream erosion can be implemented by installing stormwater Best Management Practice demonstration projects through an IEPA 319 Cost-share Program.

Applying for grants or considering future revenue from the site will be beneficial to the process. Other sources of funding can be identified from public and private sources and should include donated services/volunteerism. Work to be performed by others within the grant application's proposed scope of services can count as a fiscal match where appropriate.

Funding Recommendations

- **Develop a fiscal plan** to create a capital project plan and/or endowment towards future maintenance.
- **Expand Revenue.** Complete a business plan that reviews all sources of income, revenue opportunities (existing, new, and proposed), partnerships, potential leases, and future programming and vendor resources.
- **Increase and document volunteer** and work in-kind opportunities.
- **Investigate public/private partnerships** for improvements, including and relating to maintenance and management. This means the City, county, state, NGOs, developers, and others may participate in conjunction or cost-share per an agreed upon arrangement yet to be determined.
- **Develop partnerships** that may be used or collaborations for offsetting programming costs for special events, or in a longer partnership through an MOU/MOA outlining mutual benefits.
- **Provide updates to the Community** to increase awareness and donations.
- **Work in partnership with Madison County** for large stormwater or natural resource management improvements under the Madison County Stormwater Commission.
- **Subscribe to Grants.gov**, East-West Gateway's weekly email briefings and state grant alerts to watch for applicable grants for which to partner.
- **Subscribe to MEPRD's** newsletter and grant updates.
- **Investigate grants.** This includes grants for infrastructure, capital improvements, programs, best management practices, and amenities. Research forestry, stormwater/flooding prevention, and education grants for programmatic alignment to meet objectives.
- **Community fundraising** campaigns (big and small) involving residents to promote involvement.
- **Approach private donors.**
- **Review each project** for funding ongoing opportunities on a regular basis.
- **Keep detailed and accurate records** once grants are received for required grant reports.

Potential Funding Sources

Non-Governmental (NGOs) & Not-For-Profit Organizations

The following groups may have programs or funds to help carry out their missions at any given time:

HeartLands Conservancy – Works to protect diverse natural resources and habitats of southern Illinois.

Illinois Forestry Development Council – Supports statewide work and forest/tree canopy programs and conservation.

Morton Arboretum – Supports statewide work and forest/tree canopy programs and conservation.

National Organization of Realtors – Access charitable giving through the greater Gateway Association of Realtors.

Pheasants Forever / Quail Forever– Local Chapters often provide food plot and native grass seed to landowners.

The Sierra Club Illinois Piasa Palisades Group – Supports projects that protect this region from sprawl, unsustainable agriculture, air and water pollution, wetlands destruction, and deforestation.

The Conservation Fund – Conservation loans and green bonds programs offer flexible financing as well as sustained and expert technical assistance to land trusts and other organizations aiming to protect key properties in their communities, increase access to green and open-space, recover natural habitats, provide conservation education programs, and help people connect with nature.

The Nature Conservancy (TNC) – works to protect diverse natural habitats including wetlands and forests.

The National Wildlife Federation (NWF) – supports projects to protect and restore fish and wildlife habitat.

Trees Forever – The Working Watersheds – Buffers and Beyond program provides a 50% cost share (up to a maximum of \$2,000) to implement water quality project/demonstration sites, e.g. riparian buffers.

Non-grant Funding Opportunities

- Community Partnerships
- Corporate/Business Sponsorships
- Local Fundraisers
- Programs/Events - Diversify programming, events, and rentals to increase revenue from the landfill in fun and creative ways for the benefit of the community.
- Crowd-sourced funding
- Service Organizations

- Charitable Donations
- Volunteer Work
- Individual Donations
 - Donations of Art
 - Donations of Land
 - Financial
 - Planned estate (future) giving

Potential Private Foundations/Companies

Many communities have successfully solicited park and recreation infrastructure funding from private foundations and benefactors. Foundations are excellent sources of funding for acquisition of land for conservation, interpretation, education, and project-specific purposes. They fund a wide variety of features, including to shade structures, tennis courts, tree planting, pollinator gardens, playgrounds, ADA improvements, and educational programs. Additionally, corporations often have separate foundations or grant programs to support environmental missions. Below are some examples of these funding opportunities:

- Ameren Corporation Charitable Trust
- American Water Charitable Foundation
- American Academy of Dermatology (Shade Structure Program)
- Bank of America Charitable Foundation
- Boy Scouts of America
- Building Better Communities Program (NRPA)
- ClifBar Family Foundation
- Home Depot Foundation
- Illinois American Water Environmental Grant Program
- Illinois Clean Energy Community Foundation Pollinator Meadow Grant
- KaBOOM!
- Lowe's Charitable and Education Foundation
- Monarch Watch
- National Association of Realtors
- Scotts Miracle-Grow Foundation

Potential Public Agency Grants

All grants, regardless of source, can fluctuate from year-to-year based on annual budgets and fund availability. The list below has traditionally been valid. However, due to various unforeseen circumstances, all funding sources, information, and grant applications should be reviewed. Projects should be prioritized via timeline or as opportunities of funding present themselves for specific endeavors.

The following funding sources are available for urban forestry, trails, stormwater, open space, and green infrastructure. Some are highly selective and difficult to win. Opportunities for project funding should be weighed against the effort and potential to receive a successful award.

Unique Opportunities

Some immediate or revolving funding sources to investigate for Rebuilding and Reopening Illinois in relation to 2020-21 events:

Infrastructure Investment and Jobs Act - Passed.
Release of funds is TBD through multiple U.S. Departments.

Federal Programs

FEMA

Building Resilient Infrastructures and Communities (BRIC) grant - This program is for states, local communities, tribes and territories for mitigation activities. BRIC is a FEMA annual hazard mitigation program. The priorities are to: incentivize natural hazard risk reduction activities that mitigate risk to public infrastructure; prioritize benefits to disadvantaged communities; mitigate risk to one or more community lifelines; incorporate nature-based solutions; enhance climate resilience and adaptation; and increase funding to applicants that facilitate the adoption and enforcement of the latest published editions of building codes.

U.S. Department of the Interior

Land and Water Conservation Fund - These grants are available to cities, counties, and school districts to be used for outdoor recreation projects. Projects require a 55 percent match. All funded projects are taken under perpetuity by the National Park Service and must only be used for outdoor recreational purposes. Development and renovation projects must be maintained for a period of 25 years or the life of the manufactured goods.

U.S. Fish and Wildlife Service

Neotropical Migratory Bird Conservation Act - The NMBCA program provides matching grants to Neotropical migratory bird conservation projects

throughout the Western Hemisphere, with at least 75 percent of funding going to projects outside the United States. The competitive grants require that grant requests be matched by partner contributions at no less than a 3-to-1 ratio.

The Partners for Fish and Wildlife Program is run by the U.S. Fish and Wildlife Service (USFWS) under the Department of the Interior (DOI). The program works with private landowners to improve fish and wildlife habitat on lands through voluntary, community-based stewardship. Noting more than 90% of land in the Midwest is in private ownership, the program promotes high quality habitat through partnerships with private conservation organizations, state and federal agencies, and tribes to reach private landowners. Funding, materials, equipment, labor and expertise are shared to meet shared restoration and conservation goals.

State Programs

Illinois Environmental Protection Agency (IEPA)

Green Infrastructure Grants Opportunity (GIGO) - In the past, these grants have been made available to local units of government and other organizations to demonstrate green infrastructure best management practices to control stormwater runoff for water quality protection in Illinois. Acres of permeable pavement parking lots and alleys and riparian zones and rain gardens are techniques now in place to help restore, mimic, or enhance natural hydrology to protect and improve local water quality. It has been rumored that this program was going to be reopened in the new budget. However, given the pandemic and state's loss of income this source should be investigated prior to proceeding.

This grant is in support of stormwater and improvements through green infrastructure initiatives e.g. rain gardens, buffers, bioswales. <https://www2.illinois.gov/epa/topics/grants-loans/water-financial-assistance/Pages/igig.aspx>

Section 319(h) Nonpoint Source Pollution Control Financial Assistance Program implements Illinois' Nonpoint Source Management Program with federal funds through section 319(h) of the Clean Water Act. The funds can be for watershed planning, implementation of Best Management Practices (BMPs), or monitoring of water quality. Projects that address nonpoint source (NPS) pollution in Illinois waters that have impaired water quality are given priority.

The State Revolving Fund Loan Program includes the Public Water Supply Loan Program (PWSLP) for drinking water projects and the Water Pollution Control Loan Program (WPCLP) for wastewater and stormwater projects. Eligible projects include upgrading or rehabilitating existing infrastructure, stormwater-related projects that benefit water quality, and a wide-variety

of other projects that protect or improve the quality of Illinois's rivers, streams, and lakes. Funds can be provided for flood relief if the projects are tied to water quality improvements. Green infrastructure projects such as street tree or urban forestry programs, stormwater harvesting programs, downspout disconnection projects, and street drainage practices that mimic natural hydrology may be funded.

Illinois Department of Agriculture (IDOA)

The Healthy Forests Reserve Program (HFRP) aims to assist landowners in restoring, enhancing, and protecting forestland resources on private land through easements, 30-year contracts, and 10-year cost-share agreements. The land must restore, enhance, or measurably increase the recovery of threatened or endangered species, improve biological diversity, or increase carbon storage. Contact Madison Co. Soil and Water Conservation District regarding this process.

The Streambank Stabilization and Restoration Program (SSRP) is designed to demonstrate effective streambank stabilization at demonstration sites using inexpensive vegetative and bio-engineering techniques. Program funds may be used for labor, equipment, and materials. Recipients of the cost-share and project funding must maintain the streambank stabilization project for at least 10 years. Investigate this program and its status.

Illinois Department of Natural Resources (IDNR)

Bike Path Grant Program - This program assists local units of government to acquire, construct, and rehabilitate public, non-motorized bicycle paths and directly related support facilities.

Open Space Land Acquisition and Development (OSLAD) - OSLAD is funded with Real Estate Property Transfer Tax in Illinois. Both land acquisition and park developments are accepted in this program. It is a 50/50 cost share program on a reimbursable basis. Projects vary from small neighborhood parks to large community and county parks and nature areas. This program can pay for engineering.

The Urban and Community Forestry Assistance Grant Program - Local governments can apply for financial assistance for the development of local urban and community forestry programs; activities must help to establish, manage, conserve, and preserve the urban and community forests from inner city to associated public lands.

Illinois Urban and Community Forestry Program is a part of a nearly \$5 billion economic engine in Illinois. The state program helps assist municipalities and local units of government in developing, managing and sustaining local community forestry programs. Illinois

citizens benefit from this program by living in and near high quality diverse managed forests within TREE Village USA communities. HeartLands Conservancy can provide free assistance for this program. <https://www2.illinois.gov/dnr/conservation/Forestry/UrbanForestry/Pages/default.aspx>

The **Urban Flood Control Program** has been implemented for many years under the authority of the Flood Control Act of 1945. IDNR's Office of Water Resources (OWR) has typically applied the program to out-of-bank riverine flooding, and to the development and construction of projects that provide an outlet for stormwater systems.

Regional | Local Programs

Madison County Resource Management Environmental Grants - This grant program is designed to assist units of local government with environmental objectives and projects including solid waste management, air quality initiatives, energy efficiencies, smart growth, and stormwater abatement. The goal of the program is to promote best management practices and case studies of positive environmental projects within Madison County. Examples of funding use include; solar panels, native landscaping, and green infrastructure.

Madison County Park Enhancement Program (PEP) Grants - The Madison County Park and Recreation Program is designed to assist municipalities and park and recreation districts within Madison County to develop, enhance or expand park operations and facilities. The grant program, administered by Madison County Community Development is designed to supplement community funding for park operations.

Metro-East Park and Recreation District (MEPRD) MEPRD provides grants to supplement the efforts of local governments, special districts, and other jurisdictions who are already working on the planning, construction and management of bike, pedestrian, and park facilities to further their mission.

Park and Trail Grant - MEPRD funds projects that would fulfill two primary objectives, i.e. (1) encourage the development of regional trail segments throughout MEPRD's jurisdiction; and (2) increase MEPRD's grant funding for park projects located in currently underserved locations. Provides up to \$300,000 for construction, implementation, and acquisition. MEPRD funds must



Leveraging Resources

Working with agencies and other levels of local government is also beneficial. It is beneficial to invite funding partners into implementation process early. Allow time for each entity and their staff to seek and receive the proper approval according to their individual processes.

However, if public partners are combined with a not-for-profit, leveraging resources becomes more desirable to external funders. Most importantly, in order not to bear the full weight of the costs, the City is best served by leveraging these partnerships to generate the maximum funds and resources available.

A list of potential collaborators, resources, and key contacts is outlined below.

HeartLands Conservancy
Conservation Program
29 East Main Street
Belleville, IL 62220
Phone: (618) 566-4451

Seed Vendors

Pheasants Forever, Inc.
1783 Buerkle Circle
St. Paul, MN, USA 55110
Phone: (866) 914-7373

Millborn Seeds
2132 32nd Avenue
Brookings, SD 57006
Phone: (605) 697-6306

PureAir Natives
4630 West Florissant Avenue
Saint Louis, MO 63115
Phone : (636) 357-6433

Shooting Star Native Seeds
20740 County Road 33
Spring Grove, MN 55974
Phone: (507) 498-3944

Tree Vendors

Mason State Tree Nursery
17855 N Co Rd 2400 E
Topeka, IL 61567
Phone: (309) 535-2185

Forrest Keeling Nursery
88 Forrest Keeling Ln
Elsberry, MO 63343
Phone: (573) 898-5571

George O. White State Forest Nursery
14031 Shafer Rd
Licking, MO 65542
(573) 674-3229

Prescribed Burning

Great Rivers Prescribed Burn Association
(618) 946-9357
(618) 977-2851

National Wildfire Coordinating Group
<https://www.nwccg.gov/>
Online training for S 130 and S 190

Invasive Species Management guidelines

Illinois Nature Preserves Invasive Species Management Guidelines
<https://www2.illinois.gov/dnr/INPC/Pages/INPCManagementGuidelines.aspx>

University of Illinois Extension
Management of Invasive Plants and Pests of Illinois
https://extension.illinois.edu/sites/default/files/management_of_invasive_plants_and_pests_of_illinois.pdf

Missouri Department of Conservation
Invasive Plants
<https://mdc.mo.gov/trees-plants/invasive-plants>



The Collinsville Landfill



www.HeartLandsConservancy.org