

GRANT AWARD AGREEMENT

Fiscal Year 2023 Class A Incentive Grant Program

THIS AGREEMENT, made and entered into on the 13th day of March, 2023, by and between the **LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT**, an urban county government of the Commonwealth of Kentucky, pursuant to KRS Chapter 67A (hereinafter "Government"), on behalf of its Division of Water Quality, and **FRIENDS OF WOLF RUN, INC.**, 639 CARDINAL LANE, LEXINGTON, KENTUCKY 40503, (hereinafter "Grantee").

WITNESSETH:

WHEREAS, the Government has funds available through the Stormwater Quality Projects Incentive Grant Program to assist qualified applicants in the implementation of projects that meet the goals of the program; and

WHEREAS, the Grantee represents directly or indirectly a group of single-family residences in Fayette County who are fee-payers of the Government's Water Quality Management Fee; and

WHEREAS, the Grantee has proposed a need for the funds requested to develop and implement a proposed project by submitting a valid grant application; and

WHEREAS, the Grantee desires to implement a specific project that meets one or more Incentive Grant program goals to improve water quality, reduce stormwater runoff, and provide public or private education related to stormwater quality for the benefit of its members, community, and the general public; and

WHEREAS, the Grantee's grant application has been reviewed and selected for funding by the Government's Water Quality Fees Board in accordance with Sections 16-408 and 16-410 of the Government's Code of Ordinances;

THAT FOR AND IN CONSIDERATION OF THE MUTUAL PROMISES AND COVENANTS HEREIN EXPRESSED, GOVERNMENT AND GRANTEE AGREE AS FOLLOWS:

- (1) The Government hereby grants the Grantee the sum of \$65,520.00 (hereinafter "the Grant"), for use in implementing the project elements as listed in Attachment A which is incorporated herein by reference as if fully set out herein.
- (2) The Grantee agrees to match the Grant with contributions, labor, and other services equal to or greater than 20% of the total project cost.
- (3) The Grantee agrees to use the Grant only for the activities set forth in Attachment A.
- (4) The Grantee agrees to perform periodic reporting as detailed in Paragraph (5) herein below, and provide to the Government a Project Final Report, in digital and hard copy, within thirty (30) calendar days of the completion of the project elements following a standardized format to be provided by the Government summarizing all work completed and detailing the total grant expenditures.

- (5) The Grant to the Grantee shall be disbursed in the following manner:
- (a) The Grantee shall submit, at least once every three (3) months, a *Grant Reimbursement Form* and a *Request for Funds*, in standardized format provided by the Government, to the Government's Grant Manager designated by the Director of the Division of Water Quality for the project. The *Request for Funds* shall include documentation that the Grantee has already expended the requested funds or shall be in a position to expend properly the requested funds within thirty (30) days of receipt of the funds. The *Request for Funds* shall include full accounting of all eligible grant-related expenses, as listed in Attachment A. Copies of invoices, purchase orders, or receipts showing vendor, date, amount, and items purchased or ordered shall be provided with the *Request for Funds*.
 - (b) Each *Request for Funds* shall include documentation of all of the Grantee's Match Costs listed in Attachment A and claimed for the prior period. Each *Request for Funds* shall include a minimum of 10% cost share. For cash expenditures, this shall include receipts, showing vendor paid, date, amount, and items purchased. For volunteer hours, this shall include sign-in sheets describing the events with signatures, name, address, time in and time out (or length of event), for each participant (volunteers must be 12 years of age or older). For mileage, this shall include driver name, type of vehicle, location to and from, date, and miles driven.
 - (c) Each *Request for Funds* shall be accompanied by a *Project Status Report*, in a standardized format provided by the Government, describing the progress of the project to date, including a description and schedule of all activities completed, and hardcopy or electronic copies of materials completed and/or used to date. For educational events (if applicable), copies of the class sign-in sheets documenting the number of attendees shall be provided.
 - (d) The Government's Grant Manager shall review each *Request for Funds* and supporting documents for compliance with the terms of this Agreement and the guidelines of the Stormwater Quality Projects Incentive Grant Program. If the Government's Grant Manager finds the Grantee's *Request for Funds* is in compliance with the terms of this Agreement and the Program's guidelines and that the activity progress and management program of the Grantee satisfy the terms of this Agreement, he or she shall approve the *Request for Funds* within 15 days of receipt, and then forward it to the Division of Accounting for payment.
 - (e) Should the Government's Program Administrator determine that the Grantee is not in compliance with the terms of this Agreement and/or the Stormwater Quality Projects Incentive Grant Program, including deficiencies in progress and/or management of the project, the Division of Water Quality shall notify the Mayor's Office and the appropriate district Council person and shall meet with the Grantee on matters that prevent approval of the *Request for Funds*. Failure to resolve any such matters to the satisfaction of the Government may lead to termination of the Agreement for cause pursuant to Paragraph (25) herein below.
 - (f) The Government shall release payment of the final 10% of the Grant only after receipt and acceptance of the Project Final Report. The Government's Grant Manager shall review the Project Final Report and provide comments to the Grantee within 15 calendar days or, if acceptable, forward approval to the Division of Accounting for payment.
- (6) For any project which includes installation of permanent capital infrastructure as listed in Attachment A (not to include individual rain barrels, small rain gardens, and pond equipment), the Grantee agrees to meet all design standards specified in the Government's Engineering Manuals and/or as further described in Attachment A in the design of all Grant-funded improvements. This includes all associated activities including but not limited to erosion and sediment control, traffic control, utility relocations, seeding, etc. The Grantee

further agrees to design the facilities in such a way as not to preclude the potential for future water quality / quantity monitoring by the Government.

- (7) For any project which includes installation of permanent capital infrastructure as listed in Attachment A, the Grantee agrees to provide in hard copy and electronic format the following deliverables as they become available, each sealed by a Professional Engineer licensed in the Commonwealth of Kentucky (or Registered Landscape Architect when allowed by Kentucky Revised Statutes 323A.010):
 - Design calculations;
 - Final construction plans, including erosion and sediment control plans, traffic control plans, grading plans, etc.;
 - Final specifications and bidding documents (if applicable);
 - Detailed engineer's construction cost estimate including quantities;
 - Inspection, Operation, and Maintenance Plan laying out the plan for regular inspection and maintenance of each proposed facility for design performance and safety in accordance with manufacturer's specifications and the Government's Stormwater Manual;
 - Copies of all federal, state, and local permits, approvals, encroachments, etc. obtained for the project;
 - Record Drawing showing all field changes, and signed and sealed by the professional of record certifying the project as shown meets all original design intent;
 - Photo documentation of site conditions and improvements before, during, and after construction.
- (8) For any project which includes installation of permanent capital infrastructure listed in Attachment A, the Grantee shall provide, by the end of the design phase, certification by a Professional Engineer or Registered Landscape Architect licensed in Kentucky that all stormwater control facilities proposed for this project are feasible and viable Best Management Practices (BMPs) for controlling stormwater quality and/or quantity and are appropriate for the project site.
- (9) The Grantee agrees that any and all stormwater control facilities, including equipment and infrastructure, constructed or purchased with Grant monies shall remain the property of the Grantee, or the current property owner, or his successors and assigns, unless otherwise noted in Attachment A.
- (10) The Grantee agrees that all stormwater control facilities, including equipment and infrastructure shall remain in service and maintained by the Grantee or its representatives for at least the Service Life listed in the Inspection, Operation, and Maintenance Plan developed for each facility referenced in Paragraph (7) above. For capital infrastructure, the Grantee further accepts and agrees to enter into the "*Agreement to Maintain Stormwater Control Facilities Funded by an LFUCG Class A Stormwater Quality Projects Incentive Grant*" attached hereto as Attachment B and which is incorporated herein by reference as if fully set out herein.
- (11) The Grantee agrees, and all individual property owners with grant-funded improvements installed on their properties shall agree, to allow the Government access to perform monitoring of the project elements for compliance with this Agreement.
- (12) The Grantee agrees to comply with all applicable local, state, and federal rules, regulations, ordinances, and laws in implementation of the project.
- (13) The Grantee agrees to obtain all necessary local, state, and federal permits and approvals in a timely manner and prior to the start of any work requiring such permits or approvals.
- (14) The Grantee agrees to obtain written approval from the Government's Grant Manager or Program Administrator for any proposed changes to the Project Team or Project Plan as listed in Attachment A prior to implementing the changes. Failure to gain written approval prior to making changes may lead to termination of the Agreement for cause pursuant to Paragraph (25) herein below.

- (15) The term of this Agreement shall be from the date of this Agreement until completion of the project outlined herein. The Grantee agrees to complete the project within **18** months from the date of this Agreement. The Grantee agrees to obtain written approval from the Government's Grant Manager or Program Administrator for any time extensions beyond the grant period. Failure to gain written approval prior to making changes may lead to termination of the Agreement for cause pursuant to Paragraph (25) herein below.
- (16) The Grantee understands that the Grant shown herein in Paragraph (1) is a not-to-exceed amount, and any additional funding needed to complete the project elements listed in Attachment A is the responsibility of the Grantee. If it becomes apparent to the Grantee or the Government that the Grantee will be unable to complete the project either in the manner or for the amount described in this Agreement, then the Grantee must immediately notify the Government's Grant Manager and Program Administrator by providing a complete and detailed written explanation of its inability to comply with the terms of the Agreement. The Grantee must further provide the Government's Grant Manager and Program Administrator with a complete and detailed written explanation of any proposed changes, and the reasons for those changes.
- (17) The Grantee asserts that it is an incorporated organization registered in active status with the Commonwealth of Kentucky Secretary of State, and is in full compliance with all applicable provisions of the Lexington-Fayette Urban County Government's Code of Ordinances Chapter 5 – Buildings and Building Regulations, Chapter 7 – Finance and Taxation, Chapter 12 – Housing, and Chapter 16 – Sewage, Garbage, Refuse, and Weeds, or in compliance with Kentucky Department of Housings Buildings and Construction rules and requirements as is appropriate for those state institutions, parcels, or buildings which are subject to state regulations and oversight as opposed to local ordinances and regulations. If the Grantee becomes out of compliance with any of these provisions, it will contact the Government's Program Administrator immediately. Failure to resolve any such matters to the satisfaction of the Government may lead to termination of the Agreement for cause pursuant to Paragraph (25) herein below.
- (18) This Agreement may not be modified except by written agreement of the Government and the Grantee.
- (19) In any advertisement of the grant-funded project, whether oral or written communications, the Grantee agrees to identify the Lexington-Fayette Urban County Government as the source of the above referenced funds; the Grantee shall not specifically identify any individual or elected official as being responsible for the funds donated by the Government.
- (20) The Grantee agrees to allow the Government to publicize the Grantee's project through the Government's website and other media.
- (21) The Grantee agrees to reference the Lexington-Fayette Urban County Government's Water Quality Management Fee and the Stormwater Quality Projects Incentive Grant Program as a source of funding for the project on any permanent signage or educational brochures, presentations, websites, etc. produced using grant monies.
- (22) The Grantee is solely responsible for assuring that adequate and appropriate insurance or other necessary coverage is maintained during the term of this Agreement.
- (23) The Grantee shall provide equal opportunity in employment as required by applicable federal, state, and local laws, regulations, and ordinances.
- (24) The Government assumes no responsibility whatsoever in the Grantee's project activities. Grantee shall defend, indemnify, and hold harmless the Government from and against any and all liability, claims, damages, losses, actions, costs, expenses, obligations, fines, and assessments of whatever kind, including defense costs and attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, in whole or in part, from or by Grantee's or its contractor(s), agents, or assigns, negligent acts or misconduct, or errors or omissions, or in any way connected with the ac-

agreements, or stipulations of this Agreement, the Government shall provide the Grantee thirty (30) calendar days to address the deficiency or violation. If the Grantee does not, after the thirty (30) days, come into compliance with this Agreement, the Government shall thereupon have the right to terminate this Agreement by giving written notice to the Grantee of such termination and specifying the effective date thereof, at least five (5) calendar days before the effective date of such termination. In that event, all finished or unfinished documents, receipts, and reports prepared by the Grantee shall, at the option of the Government, become its property and the Grantee shall immediately repay to the Government all monies received pursuant to this Agreement less any amount representing just and equitable compensation for the Government's share of any satisfactory work completed pursuant to the Agreement; provided, however, that for any project involving the construction of capital infrastructure, other than feasibility only projects, the Government's share of any satisfactory work completed shall not include feasibility or design costs.

(26) The Grantee's sole remedy for a breach of this Agreement by the Government shall be limited to the amount of the Grant.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement at Lexington, Fayette County, Kentucky, this the day and year first above written.

**LEXINGTON-FAYETTE URBAN COUNTY
GOVERNMENT**

BY: *Linda Gorton*
LINDA GORTON, MAYOR

ATTEST:
Mackenzie Stock
CLERK, URBAN COUNTY COUNCIL

Deputy

Grantee Organization: **FRIENDS OF WOLF RUN, INC.**
639 CARDINAL LANE
LEXINGTON, KY 40503

BY: *Ken Coke*
NAME: Kenneth B. COKE
TITLE: Treasurer

The foregoing Agreement was subscribed, sworn to and acknowledged before me by Mary K. Yoshinaga, as the duly authorized representative for and on behalf of PNC Bank, on this the 24 day of January, 2023.
My commission expires: 09/17/2025

Mary K. Yoshinaga
NOTARY PUBLIC



ATTACHMENT A
to the GRANT AWARD AGREEMENT
between Lexington-Fayette Urban County Government (LFUCG) and
Friends of Wolf Run, Inc. (FOWR)

GRANT PROGRAM


**2023 Stormwater Quality Projects Incentive Grant Program
Class A Neighborhood Projects**

- Funded through the LFUCG Water Quality Management Fee
- Administered by the LFUCG Division of Water Quality in the Department of Environmental Quality & Public Works

PROJECT TEAM AND CONTACT INFORMATION

Grantee Organization: Friends of Wolf Run, Inc. (FOWR)
639 Cardinal Lane
Lexington, KY 40503
KY Organization #0612068

Organization President: Bruce Hutcheson, President
859-619-2233 (phone)
bhutches54@gmail.com (email)

**Primary Project Contact
and Project Manager:** Ken Cooke, Treasurer
859-940-8234 (phone) 
ken.cooke@canewoods.com (email)

**Secondary Project
Contact:** Lisa Collins Ph.D
859-797-0011 (phone)
friend@wolfrunwater.org (email)

Individual Project Key Stewards (see Project Steward's list)

Project Steering Committee: Dr. Kenton Sena, University of Kentucky
Will Overbeck, Plant Ecologist
Jean Watts, Water Quality Specialist
Jannine Baker, Native Plant Specialist

Project Stewards and cooperating organizations by Project Area:

1. Deauville Drive Greenway: Jerome Higginbotham, Key Steward JH Technology Trust, Dunbar High School.
2. Preston's Cave Spring Restoration: Jerry Weisenfluh, Key Steward assisted by Skybox Ecological Restoration and Geomancer Permaculture Contractor.
3. Valley Park Stream Clean: Adonya Boyle, Key Steward, Will Anglin, Cardinal Valley Park Activities Board, Trash cleanup, public education, native planting, invasive control.
4. Gardenside Park Stream Buffer Maintenance: Kristine Goggin, Key Steward, Gardenside Neighborhood Association Partners. Infill planting, neighborhood engagement.
5. Buffer Browsers (Goats for invasive control): Paula Singer, S.W.M.B.O. Coordinator with David Neville, and Goatherd with Kentucky State University Cooperative Extension Technical Support.
6. Pine Meadow Park and Right of Way: Julie Marfell, Key Steward, Pine Meadows Neighborhood Association Will Overbeck, contractor, Vaughn's Branch and Perennial Spring Restoration and buffer maintenance.
7. Floating Wetland Island Installation: Steve Rogers, McConnell Springs Park Coordinator.

8. Killrush Greenway Stream Food Forest: Nachie Leandro Braga, Key Steward, Killrush Drive and Cardinal Valley Neighborhood Geomancer Permaculture, Contractor Invasive Clearing, New “Food Forest Plantings, Education.
9. St. Raphael Tobits Trace Spring Trail: Laurie Curry Daugherty, Key Steward assisted by Skybax Ecological Services, Contractor.
10. Soil Restoration Research / Study: Dr. Kenton Sena, University of Kentucky Principal Investigator assisted by Honors Program Student Aid and U.K. Regulatory Services Labs.

PROJECT PLAN ELEMENTS

The goal of the Friends of Wolf Run Water Quality Neighborhood Stream Buffer Stewardship Program is to improve water quality by restoring riparian stream buffers along Wolf Run Creek and its tributaries through engaging community leaders and volunteers in a coordinated, quality-assured effort.

The objective is to create and maintain a stream buffer demonstration project and engage neighborhood leadership in maintaining stream buffers on both public and private property; to recruit, train, supply, and support volunteer stewardship groups to assist LFUCG and streamside property owners in managing vegetative riparian buffers along Wolf Run and its tributaries; to educate the public about the value of streamside buffers; to conduct performance monitoring showing water quality impacts of streamside buffer projects; to conduct comparative studies on various control measures; and to provide professional development and education for institutional property owners.

Project Strategy and Work Plan:

A. Volunteer Stream Buffer Stewardship Initiative

Ongoing community involvement through steward-planned work activities which will identify and recruit volunteers from the neighborhoods adjacent to particular parks, greenways, or other public spaces. This will be accomplished by engaging residents in a progressive level of involvement through the following components:

1. ***Conducting stream walks*** along portions of the stream and inviting area residents via e-mail, door-to-door flyers, postcards, and/or neighbor-to-neighbor personal invitations. During stream walks, we discuss water quality, habitat, and streamside buffer issues and management strategies with the residents. We discuss and seek approval for a remediation plan for the stream from those participating.
2. ***Planning Trash Cleanup Days***. This event incorporates typically light litter pickups and trash removal.
3. ***Attacking Invasive Plants via bushwhacking parties***. Use hand tools to remove bush honeysuckle, garlic mustard, multi-flora rose, and Japanese Knot Weed. These activities involve treating cut shrubs with herbicide in accordance with practices developed by the Invasive Plant Working Group. These activities are to provide neighborhood volunteers with firsthand experience in dealing with invasive plants.
4. ***Follow-up Native Plantings***. Using volunteers to install perennials, shrubs, and trees according to a planting plan to acquaint neighborhood residents with appropriate plant choices.
5. ***Bringing in the “Big Kahuna”***. Once the neighborhood fully understands the process, LFUCG, Friends of Wolf Run, and others can then proceed with full-scale invasive control and native plantings with newfound understanding and support from neighborhood leadership.
6. ***Volunteer Leadership Training and Support*** through on-site technical support and online training.
7. ***Education and Outreach*** will be done through the distribution of “Living Along Kentucky Streams” and a “Stream Buffer Brochure” produced by the University of Kentucky Cooperative Extension Service at workdays, when promoting events, and door-to-door distribution to streamside property owners. Installing educational signage on site.
8. ***Effectiveness Monitoring***. Continuing water quality checks for field parameters, (Dissolved Oxygen, pH, Temperature, and Conductivity), soil condition, as well as nutrients, via field spectrophotometers, and pathogens via *E. coli* analysis in cooperation with LFUCG Town Branch Lab and Bluegrass Community and Technical College.

9. **Identification and Support for “Key Stewards”** to provide ongoing leadership for the parcel/greenway to organize follow-up efforts to keep invasive in check, water plants, and organize additional workdays to take place beyond the scope of the project.
10. **Clearly marking stream buffer improvement areas** will be done with fiberglass posts and educational signs.

B. Individual Project Site Support

This project incorporates support for ten (10) project sites, technical support, training activities, a demonstration project, and overall administration and coordination (element 11), as listed below.

1. Deauville Drive Greenway
2. Preston’s Cave Spring Restoration
3. Valley Park Stream Clean
4. Gardenside Park Stream Buffer Maintenance
5. Buffer Browsers (Goats for invasive control)
6. Pine Meadow Park and Right of Way
7. Floating Wetland Island Installation
8. Killrush Greenway Stream Food Forest
9. St. Raphael Tobits Trace Spring Trail
10. Soil Restoration Research / Study
11. Administration, finance, grant management, field support

NOTE: See Figure 1 – Project Location Map. Also, see pages 9-27 for individual project site details, and budgets.

C. Public Involvement

Friends of Wolf Run will accomplish public involvement through the support of a volunteer network to include sponsoring neighborhood associations, school groups, property owners, researchers, and contractors engaging local residents.

Friends of Wolf Run will provide the overall project management through the distribution of publications, coordinating field trips to each site, providing signage and boundary marking, and promotions via email, social media, and website publications.

1) DESIGN:

No grant-funded activities shall occur until the LFUCG Grant Manager gives Notice to Proceed, in writing, for the start of the project and work in public right-of-way.

- Any work proposed within or on public right-of-way, easement, or LFUCG-owned property will require one or more permits or approvals. This includes installation permits for connection into any existing curb inlet or stormwater manhole located within public right-of-way. Please contact the appropriate staff:

Parks and Recreation, Chris Cooperrider – ccooperrider@lexingtonky.gov
 Environmental Services (greenways), Demetria Mehlhorn – dkimball@lexingtonky.gov
 Environmental Services (street trees), Heather Wilson – hwilson@lexingtonky.gov
 Engineering (right-of-way), John Cassel – jcassel@lexingtonky.gov
 Engineering (new development), Hillard Newman – hnewman@lexingtonky.gov
 Sanitary Sewers, Chris Dent – cdent@lexingtonky.gov
 Stormwater, Mark Sanders– msanders@lexingtonky.gov

REPORTING REQUIREMENTS

In addition to the reporting requirements outlined in the Grant Award Agreement, the following special items are noted for this project:

1. The Organization shall submit copies of the herbicide application plan to the LFUCG Grant Manager and the Division of Environmental Services prior to work beginning.
2. All attachments to Requests for Funds & Project Status Reports shall reference the associated line in Table 2 – Eligible Expenses.

EQUIPMENT

Any equipment purchased with the Grant shall remain the property of the Organization.

PERMANENT FACILITIES / INFRASTRUCTURE

Permanent Capital Infrastructure: This grant does not include “Permanent Capital Infrastructure” as defined in the Grant Award Agreement. Attachment B is not required for this Agreement.

Monitoring: The Organization agrees to allow LFUCG staff access to the project site(s) to monitor the installed features for compliance with this agreement. Water quality sampling via grab samples or other methods may be employed by LFUCG staff as part of LFUCG’s annual reporting requirement of its Kentucky Pollutant Discharge Elimination System (KPDES) MS4 Phase 1 Permit.

SITE / CONSTRUCTION ACCESS

If work is to be performed on private property (including LFUCG-owned), the Organization is responsible to obtain written authorization from the affected property owner(s) allowing such access. No permanent feature (including plantings), shall be placed upon private property without prior signed authorization from the owner. The written authorization(s) shall be provided to the LFUCG Grant Manager prior to work commencing.

ADDITIONAL GRANT STIPULATIONS

1. Tree plantings shall be coordinated with existing utilities prior to plantings, and if possible, trees shall not be planted within 10' of an existing utility. Encroachment agreements shall be obtained when working within any public or private utility areas.
2. Applicant shall obtain written approval/agreement prior to work being done on properties not owned by the Applicant.
3. Applicant shall verify the need and ensure all permits are received (i.e., FEMA, Army Corps, KDOW, etc.) prior to any streambank stabilization work.
4. The project shall not proceed with field work until written approval to proceed is obtained from the Grant Administrator or Director of Water Quality, because of the potential for conflict with future LFUCG projects.
5. Activities proposed for project site #4 (i.e., Gardenside Park Stream Buffer Maintenance) shall be restricted to the Holly Springs side of the creek because of RMP construction activities scheduled for the north side of the creek. Access to the right descending bank (i.e., Gettysburg/ Normandy side) will be restricted due to the sanitary sewer project.
6. Applicant shall obtain encroachment agreements for each public site from Division of Environmental Services.
7. Organization proposes a larger cost share beyond that required by the grant program. Budget shall reflect the 25.8% cost share offered in the application (approximately \$22,727.20).

GRANT PERIOD & PROJECT SCHEDULE

The grant period starts on the date of execution by the Mayor and extends for the time period as listed in the Grant Award Agreement. Any time extensions must be approved in writing by the LFUCG Grant Manager. The project schedule shown in Table 1 is preliminary. Proposed changes to the project which alter this schedule significantly shall be discussed with the LFUCG Grant Manager prior to implementation.

TABLE 1 – PRELIMINARY PROJECT SCHEDULE

Activity	Anticipated Date
Approval of Grant Award Agreement and Notice to Proceed (NTP)	March 2023
Convening of project steering committees	Within 1 week of NTP
Approval of work plan by property managers (Parks, Greenways)	Within 30 days of grant award notification
Conduct Stream Walks in new project areas	April 2023
Conduct Stream Clean Up and Trash Removal	April 2023 - October 2024
Conduct Invasive Plant Removal Work Days	April 2023 - October 2024
Conduct native plant installations	May 2023 - October 2024
Follow up work days in existing riparian areas	May 2023 - October 2024
Provide Project Final Report to LFUCG	September 2024

PROJECT BUDGET – GRANT ELIGIBLE EXPENSES

Table 2 lists the Eligible Expenses for this project. Only properly invoiced items shall be reimbursed with grant monies or counted toward the Organization’s cost share. Any work performed on this project prior to Grant Award by the Urban County Council and Notice to Proceed from the LFUCG Grant Manager is not an eligible expense and shall not be reimbursed or counted toward the cost share. The Supplemental Project Element Information section lists Individual Project Budgets generated from the grant application and are included for informational purposes only. Table 2 remains the official list of Eligible Expenses for this project.

Hours worked by participants under the age of 12 shall not be counted toward the cost share.

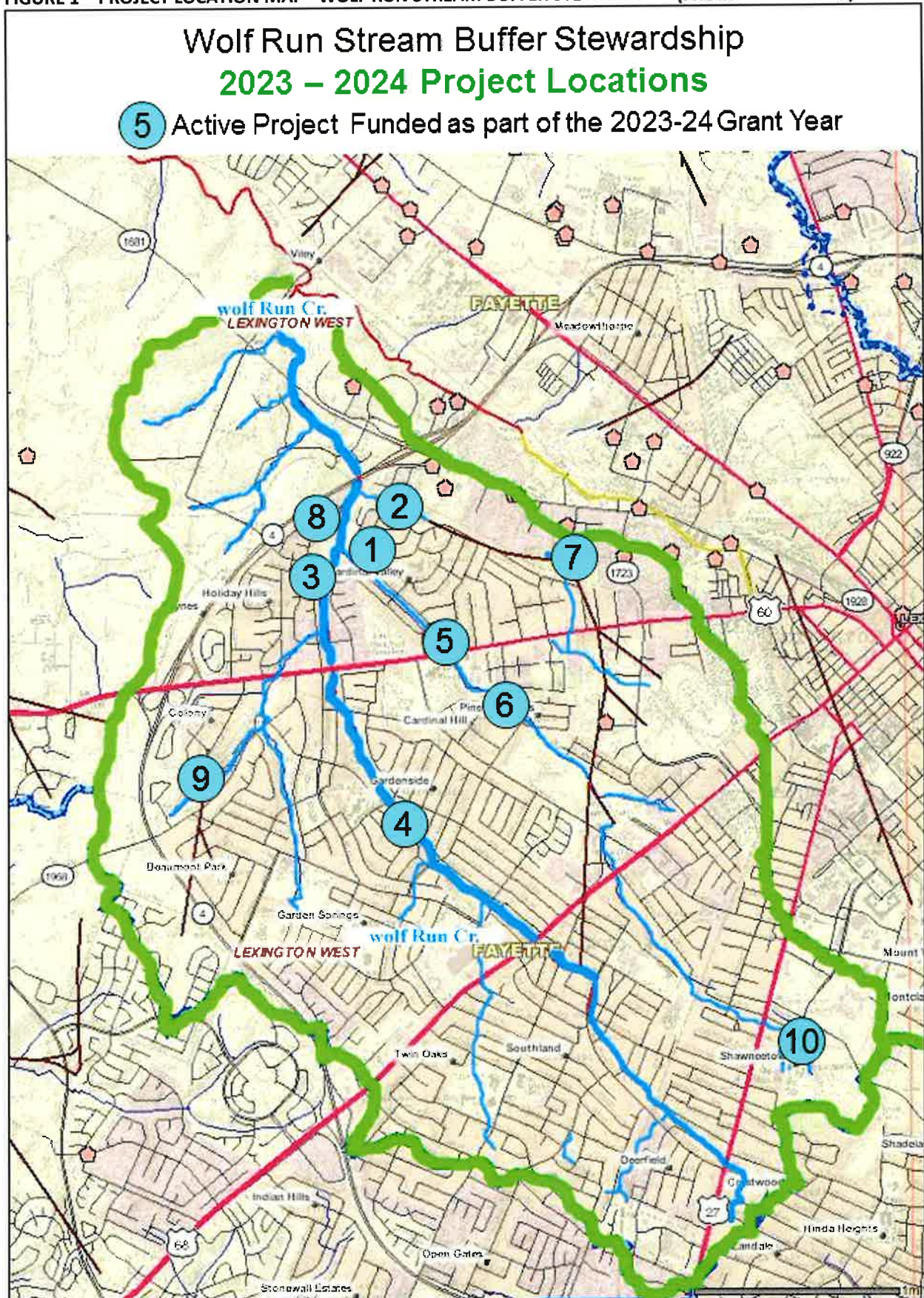
No work on any item outside of the project scope described herein, or any item to be covered by the contingency budget shall be performed without prior written approval from the LFUCG Grant Manager or Grant Administrator. Failure to do so may result in non-reimbursement for any such items.

Any donated professional service hours not currently listed in the Eligible Expenses shall be valued, at a maximum, at the Median Hourly Wage for the expertise provided – from the U.S. Department of Labor, Bureau of Labor Statistics, State Occupational Employment and Wage Estimates for Kentucky (current website: www.bls.gov/oes/current/oes_ky.htm).

TABLE 2 – ELIGIBLE EXPENSES (FROM APPLICATION)

	TYPE OF EXPENSE	PARTICIPANTS	ITEM	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE
1	Contracted Professional Services	Various Service Providers	On site activities including clearing, planting, design and labor	\$ 2,600.00	\$ 39,120.00	\$ 41,720.00
2	Donated Professional Services	Various Professionals	Evaluation, design, supervision, training, technical support	\$ 8,741.00	\$ -	\$ 8,741.00
3	Field Day	Friends of Wolf Run Trustees	Field Trip for Project Participant and Key Stewards	\$ 250.00	\$ 250.00	\$ 500.00
4	Internet Information Services	Friends of Wolf Run Trustees	Social Media and Web Site Operations	\$ 500.00	\$ -	\$ 500.00
5	Laboratory Analysis	UK Research Services	Soil sample analysis and supplies	\$ -	\$ 2,200.00	\$ 2,200.00
6	Materials and landscaping supplies	Area Vendors	Landscaping supplies, volunteer hand tools, safety equipment		\$ 6,650.00	\$ 6,650.00
7	Plant Materials	Area Nurseries and Landscape Suppliers	Native seed, plants, grasses, shrubs, trees and cuttings	\$ 950.00	\$ 15,050.00	\$ 16,000.00
8	Printing	Friends of Wolf Run Trustees	Printing, meeting handouts, Extension Publications	\$ 500.00	\$ 300.00	\$ 800.00
9	Project Management	Project Leadership	Coordination, purchasing control, organization, promotion, accounting, finance and contractor supervision	\$ 6,924.20	\$ -	\$ 6,924.20
10	Signage	Area Vendors	Educational, interpretive and boundary marking signs	\$ -	\$ 1,950.00	\$ 1,950.00
11	Volunteer Time	Community Partners	Participation in Workdays, Field Days, Workshops and Events	\$ 2,262.00	\$ -	\$ 2,262.00
12			Total Project Budget	\$ 22,727.20	\$ 65,520.00	\$ 88,247.20
				Organization Share 25.8%	Grant Share 74.2%	
				*COST SHARE % = 25.8% OK MUST BE ≥ 20%		

FIGURE 1 – PROJECT LOCATION MAP - WOLF RUN STREAM BUFFER STEWARDSHIP (FROM APPLICATION)



SUPPLEMENTAL PROJECT ELEMENT INFORMATION

Note: Supplemental project element information is provided by the Organization from the application (see pages 6-25).

Project Sites

1. Deauville Drive Greenway
2. Preston's Cave Spring Restoration
3. Valley Park Stream Clean
4. Gardenside Park Stream Buffer Maintenance
5. Buffer Browsers (Goats for invasive control)
6. Pine Meadow Park and Right of Way
7. Floating Wetland Island Installation
8. Killrush Greenway Stream Food Forest
9. St. Raphael Tobits Trace Spring Trail
10. Soil Restoration Research / Study

FIGURE 2 – Project Site 1 Detail: Valley Deauville Drive Valley Park Right Bank - 300 foot section (FROM APPLICATION)



Personnel

Jerome Higgenbotham, Key Steward, Jessie Higgenbotham Technology Trust, Dunbar High

Activity and Outlook

Having completed work in the Deauville Drive Greenway, our Key Steward and his students at Dunbar High School through their Peace Garden on native plant propagation will open a new native planting area in recently cleared areas along the Wolf Run right descending bank in Valley Park cleared by volunteers from HOR Engineering's Young Professional's Organization.

Key Steward Jerome Higgenbotham coordinates with the Neighborhood and Lexington Parks providing reporting and maintenance in between their visits. Activities include neighborhood and school-based work days along the creek controlling invasive plants, collecting litter and blown trash, and expanding the coverage area as time and hand tools permit with native plants.

Water Quality Impact. 29, 225 Square Feet of buffer filtering Sediment, nutrients, pathogens and providing temperature Moderation

- **Stormwater Volume Impact** 14, 612 cubic feet of storage from the buffer zone (Per Stormwater Manual

TABLE 3 – Project Site 1 Budget (FROM APPLICATION)

Line # Deauville Road Valley Park Right Bank Buffer Project 2023-2024										
1	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
2	Volunteer Time	JHTT, Cardinal Valley Neighborhood	Follow-up control of honeysuckle/weeds; planting; mulching	\$ 7.25	Per Hour	40	\$ 290.00	\$ -	\$ 290.00	
3	Project Management	Jesse Higginbotham Technology Trust	Jerome Higginbotham Key Steward volunteer organization and planning	\$ 18.00	Per Hour	20	\$ 360.00	\$ -	\$ 360.00	
4	Project Management	Friends of Wolf Run Trustees	Grant Accounting, Purchasing, Financial Administration	\$ 13.56	Per Hour	5	\$ 67.80	\$ -	\$ 67.80	
5	Plant Materials	Area Nurseries, JHTT KY Division of Forestry	Seed, shrubs, tree whips and nursery stock	\$ 1,500.00	Per Project	1	\$ -	\$ 1,500.00	\$ 1,500.00	
6	Materials and landscaping supplies	Area Vendors	Landscaping supplies, mulch, volunteer support	\$ 500.00	Per Project	1	\$ -	\$ 500.00	\$ 500.00	
7	TOTAL PROJECT BUDGET:							\$ 717.80	\$ 2,000.00	\$ 2,717.80
8								ORGANIZATION SHARE 26.4%	GRANT SHARE 73.6%	
9	*COST SHARE % = 26.41%									
10										

FIGURE 3 – Project Site 2 Details: Preston's Cave Spring Woodland Stream Buffer Repair (From Application)



Personnel

- Jerry Weisenfluh, Key Restoration Steward
- Jannine Baker, Native Plant Specialist
- Jerry Davis, Certified Herbicide Applicator
- Gary Libby, Skybox Ecological Services (contractor)
- Nachie Leandro Braga, Geomancer Permaculture, (Contractor)
- Officer Michael Jones, Public Safety Contact
- Ken Cooke, Friends of Wolf Run, Grant Administration, Purchasing, Finance,
- Chris Cooperrider, Lexington Parks Contact
- Roberta Burnes, Neighborhood Contact, Historian

Activity and Outlook

Effort will be devoted to restoring the riparian buffer zone with native vegetation with aim of increasing the plant diversity to help stabilize the plant communities and resist competition from the invasive plant species that dominate the forest understory. This project will expand on past efforts by:

- Clearing new areas of invasive in the drainage area, including the buffer around a tributary spring.
- Performing follow-up treatment of re-sprouts in areas cleared in the past.
- Carrying out an invasive "winter creeper" control demonstration project using non-chemical means.
- Supporting volunteers carrying out the additional clearing of the creek floodplain and drainage area.
- Supporting community engagement through volunteer field days, training, and education.

Project components

1. Bush Honeysuckle will be cut as near to ground level as feasible, the stumps treated with herbicide, and the stem and branches distributed so that they are below waist level and dispersed in the understory. Large stems may be stacked in order to minimize tripping hazards.
2. Existing desirable tree and shrub species will be flagged in order to avoid damage during and after restoration work.
3. Native species to be emphasized in re-plantings here will include Willow, Elderberry (*Sambucus nigra*), Rusty Blackhaw viburnum (*Viburnum rufidulum*), Hydrangea, Dogwoods, Spicebush, Bladdernut, Cutleaf Cone Flower (*Rudbeckia laciniata*), and other selected shrubs and perennial groundcover as found in the Park's Natural Resources Management Plan. (e.g., *Amorpha fruticosa*, *Cephalanthus occidentalis*, *Physocarpus opulifolius*, *Ptelea trifoliata*, *Rosa setigera*, *R. palustris*, *Sambucus canadensis*, *Viburnum dentatum*, *Zanthoxylum americanum*). Plantings should include shade tolerant species of trees, shrubs and perennial ground cover.
4. Sediment control cross veins composed of large woody debris collected on site will be installed as a demonstration project to help control runoff erosion and downcutting from drainage from adjacent commercial properties that enter the McConnell Branch Tributary and provide a teaching tool for use of locally sourced materials for slope management.
5. Volunteers will work to control bush honeysuckle re-sprouts, garlic mustard and other invasive in previously cleared areas in addition to supplemental planting and seeding in accordance with the Park's Natural Resources Management Plan.
6. A community-wide work/exploration day will be held, usually the last Sunday in April, showcasing work done in the park and involving community volunteers in specific restoration activities.
7. The Natural Resources Management Plan will be updated with a revised plant list and GIS based map of the park property.

Preston Cave Spring Woodland Buffer Project Schedule

1. Project Team consultations headed by Jerry Weisenfluh, Key Restoration Steward will be convened within 30 days of grant notice to proceed.
2. Spring 2023: removal of alien plants along streams and in wetlands.
3. Spring and Fall 2023 - Spring 2024: planting of native plants (as outlined above).
4. Spring 2023, Spring 2024 Conduct Volunteer Field Day.
5. Fall 2023 - Spring 2024: Continue clearing work and native plantings.
6. Fall 2024: seminar and release updated plan and ecological maps.

TABLE 4 – Project Site 2 Budget (FROM APPLICATION)

Line #	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE	QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
2	Contracted professional services	Skybox Ecological Services, LLC	Bush Honeysuckle follow up treatment, cut, treat new and resprouts	\$ 1,200.00 per acre	2	\$ -	\$ 2,400.00	\$ 2,400.00	
3	Contracted professional services	Skybox Ecological Services, LLC	Winter Creeper Control/native seeding Demonstration Project	\$ 2,500.00 per quarter acre	1	\$ -	\$ 2,500.00	\$ 2,500.00	
4	Donated Professional Services	Jerry Davis, Certified Herbicide Applicator	Invasive Plant Control, Forest Restoration Area outside contracted zones	\$ 18.40 Per Hour	40	\$ 736.00		\$ 736.00	
5	Donated Professional Services	Jannine Baker, Native Plant Specialist	Plant sourcing, volunteer training, installation and design	\$ 40.00 Per Hour	80	\$ 3,200.00		\$ 3,200.00	
6	Contracted professional services	Geomancer Permaculture	honeysuckle, multiflora rose. Winter creeper removal	\$ 6,000.00 per acre	1	\$ -	\$ 6,000.00	\$ 6,000.00	
7	Contracted professional services	Geomancer Permaculture	Erosion Control Demonstration area using large woody debris and Bush Honeysuckle cuttings	\$ 1,000.00 per project	1	\$ -	\$ 1,000.00	\$ 1,000.00	
8	Plant Materials	Geomancer Permaculture	Native woody and herbaceous shade tolerant plants, Delivery and Installation	\$ 2,750.00 per project	1	\$ -	\$ 2,750.00	\$ 2,750.00	
9	Volunteer Time	Friends of Wolf Run, Env. Commission, Community Volunteers	Follow-up control of honeysuckle/weeds; planting; mulching	\$ 7.25 per hour	60	\$ 435.00	\$ -	\$ 435.00	
10	Project Management	Key Steward On Site, Jerry Weisenfluh	Contractor Supervision, Volunteer Coordination, project management, Follow up planting, control areas outside contracted zones	\$ 19.33 per hour	80	\$ 1,546.40		\$ 1,546.40	
11	Project Management	Friends of Wolf Run Treasurer	Financial Management, Grant Reporting, Finance	\$ 18.00 Per Hour	20	\$ 360.00	\$ -	\$ 360.00	
12	Plant Materials	Area vendors, nurseries and seed distributors	Tree whips, shrubs, perennial plants and Seed outside of contracted zones	\$ 1,000.00 Per Project	1	\$ -	\$ 1,000.00	\$ 1,000.00	
13	Materials and landscaping supplies	Area Vendors	Volunteer Tools, supplies, support materials	\$ 750.00 Per Project	1	\$ -	\$ 750.00	\$ 750.00	
14	TOTAL PROJECT BUDGET:						\$ 6,277.40	\$ 16,400.00	\$ 22,677.40
15							ORGANIZATION	GRANT	
16							SHARE	SHARE	
17							27.7%	72.3%	

FIGURE 4 – Project Site 3 Detail: Valley Park, Stream Clean (FROM APPLICATION)



Personnel

Adonya Boyle, Nature Studies Teacher, Cardinal Valley School

Activity and Outlook

This project supports neighborhood engagement in twice yearly stream cleanup events involving scouts, students from Cardinal Valley Elementary, the Cardinal Valley Parks Activities Board and families from the Cardinal Valley Neighborhood.

Funding will support this effort with materials and supplies for the cleanup and some infill native plantings along the stream buffer and in the park.

FIGURE 5 – "Bucket of Boots" (FROM APPLICATION)



"Bucket of Boots" will help kids who often arrive with inappropriate foot ware for working in and around a stream in the park. The galoshes will be stored at Cardinal Valley Elementary and used when doing outdoor activities at the park.

Water Quality Impact

Maintenance of 149,600 square feet of stream buffer filtering sediment, nutrients, and pathogens and providing temperature moderation maintained.

Stormwater Volume Impact

74,800 cubic feet of storage from the buffer zone (per Stormwater Manual)

TABLE 5 – Project Site 3 Budget (FROM APPLICATION)

Valley Park Stream Cleanup Campaign 2023-2024									
Line #	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE
2	Volunteer Time	Scouts, school students, neighborhood families	Litter pickup, Planting, Seeds	\$ 7.25	Per Hour	30	\$ 217.50	\$ -	\$ 217.50
3	Project Management	Adonya Boyle, Cardinal Valley Elementary	Project coordination, promotion, organization, communication	\$ 18.00	Per Hour	10	\$ 180.00	\$ -	\$ 180.00
4	Project Management	Friends of Wolf Run Trustees	Grant Accounting, Purchasing, Financial Administration	\$ 18.00	Per Hour	5	\$ 90.00	\$ -	\$ 90.00
5	Plant Materials	Area Nurseries	Tree Whips, Seed and Perennial Flowering	\$ 300.00	Per Project	1	\$ -	\$ 300.00	\$ 300.00
6	Materials and supplies	Area Vendors	"Bucket of Boots" for kids needing appropriate footwear for participating in	\$ 700.00	Per Project	1	\$ -	\$ 700.00	\$ 700.00
7	Materials and landscaping supplies	Area Vendors	Landscaping supplies, mulch, volunteer support materials	\$ 500.00	Per Project	1	\$ -	\$ 500.00	\$ 500.00
8	TOTAL PROJECT BUDGET:						\$ 487.50	\$ 1,500.00	\$1,987.50
9							ORGANIZATION	GRANT	
10	*COST SHARE % = 24.53%						SHARE	SHARE	
11							24.5%	75.5%	

FIGURE 6 – Project Site 4: Gardenside Park (After Sanitary Sewer Project is complete)



Personnel

Kristine Goggin, Key Steward, Gardenside Neighborhood Association, Partners

Project Team

Key Steward, Kristine Goggin, Planning Consultant, Susan Spalding, Water Quality Consultant, Susan Cohn, Native Plant Consultant, Charles Chandler, Neighborhood Association Leadership, Eric Huffer.

Activity and Outlook

Gardenside Neighborhood Leadership is requesting funding for continued maintenance of a robust stream buffer restoration effort through the park and on private property where the stream runs through the neighborhood. Sanitary Sewer work and major park renovations should be complete by the time the grant term begins. We will work closely with city contractors to make sure our activities do not interfere with ongoing work or maintenance contracts.

Gardenside Buffer activities planned include

- Revitalization of community involvement in Gardenside Park through
 - Educational events aimed at children and their families; and
 - Educational signage reflecting the stream buffer ecosystem and health of watersheds.
- Engaging professional contractors to control difficult invasive such as poison ivy and for the planting of larger trees.
- Purchase and planting of two larger balled trees for the stream buffer
- Support for private property owners working to control invasive and plant natives along their stream.
- Participation in City-wide events such as Water Week, Tree Week and Nature Hop
- Support volunteers to participate in stream buffer workdays at Gardenside Park, such as; snacks, work tools, gloves, etc.
- Stream bank naturalization/restoration on the SE and NW (adjacent to the former tennis court) areas of the Yorktown side of the park streambank was previously delayed due to the sewer project work.
- Water Quality Impact - 800 square feet of new stream buffer, 15,400 square feet of stream buffer maintained filtering Sediment, nutrients, pathogens and providing temperature Moderation.
- Stormwater volume impact 8,200 cubic feet of storage from the buffer zone (per Stormwater Manual)

TABLE 6 – Project Site 4 Budget (FROM APPLICATION)

Gardenside Park Stream Buffer Maintenance/Expansion, 2023-2024										
Line #	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE	QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE		
2	Volunteer Time	Area neighbors	Litter pickup, Invasive management, planting, seeds, educational field days	\$ 7.25 Per Hour	20	\$ 145.00	\$ -	\$ 145.00		
3	Contracted Services	Bid/Skybox/Ecogro	Poison Ivy Control, Large Tree Installation	\$ 400.00 Per Visit	3		\$ 1,200.00	\$ 1,200.00		
4	Donated Professional Services	Water Quality/Native Plant Experts	Plant selection and acquisition, planting supervision, effectiveness monitoring	\$ 25.00 Per Hour	5	\$125.00		\$ 125.00		
5	Project Management	Key Steward, Kristine Goggin	Project Coordination, Neighborhood Engagement, Communications and Planning	\$ 18.00 Per Hour	10	\$ 180.00	\$ -	\$ 180.00		
6	Project Management	Friends of Wolf Run Trustees	Grant Accounting, Purchasing, Financial Administration	\$ 18.00 Per Hour	5	\$ 90.00	\$ -	\$ 90.00		
7	Plant Materials	Area Nurseries	Tree Whips, Seed and Perennial Flowering Plants	\$1,250.00 Per Project	1.4	\$ 250.00	\$1,500.00	\$ 1,750.00		
8	Materials and landscaping supplies	Area Vendors	Landscaping supplies, mulch, volunteer support materials	\$300 Per Project	1	\$ -	\$ 300.00	\$ 300.00		
9	TOTAL PROJECT BUDGET:						\$ 790.00	\$ 3,000.00	\$ 3,790.00	
10							ORGANIZATION SHARE	GRANT SHARE		
11							20.8%	79.2%		
12	*COST SHARE % = 20.84%									

FIGURE 7 – Project Element 5: Vaughn’s Branch at Oxford Circle Stream “Buffer Browser” Project (FROM APPLICATION)



Personnel

Paula Singer, Project Coordinator
David Neville, Goatherd Contractor

Peggy Henson, Cardinal Valley Neighborhood Liaison
Ken Cooke, Grant management, financial reporting

Technical Advisors

Dr. Kenneth Andries, Extension Specialist Small Ruminants, Kentucky State University
Emily Clement, Veterinary Technologist, Field Researcher, Cooperative Extension,
Jody Thompson, Research & Extension Associate, Forestry & Natural Resources
Kirk Pomper, PhD. Director of Land Grant Programs, Dean & Professor College of Agriculture, Community & the Sciences.

Volunteer Goat "Wranglers"

Katie Mashburn, Nicole McClure-Cox, Mary Anne Olson, Van LaFlair, John LaFlair, Peter Brown, Bonnie Jacobs, Ximena Grijalva McCollum, Shawn Moffitt, Leslie Heerman, Molly DePerna, Theresa Gilbert, Jennifer Hollis-Cole

Activity and Outlook

This project element seeks to demonstrate use of small ruminant browsers (Browsing goat species) to manage stream buffer zone invasive species improving water quality through a more diverse plant community.

Water Quality Impact

"The project area is bisected by Vaughn's Branch Creek, a tributary of the Wolf Run Creek watershed. The Oxford Circle Area was developed at a time when there was little to no consideration for Stormwater management practices. As a result, most of the buildings in the Circle experience some degree of water inundation during heavy storm events. The 1983 Kenroy Report illustrated structures that had been inundated during flooding events. The Urban County Government undertook a number of stormwater management projects during the late 1980s and 1990s. The City along with Friends of Wolf Run, a non-profit organization, continues to this day to advance water quality and quantity projects. These stormwater improvements within the watershed include protecting stream banks from development encroachment, reducing existing impervious surface areas, and riparian stream bank reforestation.

FIGURE – 8 Location and the Use of Goat Browsing (FROM APPLICATION)



David Neville with his team of browsers

Visible from Versailles Road and Oxford Circle the removal of bush honeysuckle through the use of goat browsing will have a profound positive impact on the water quality and the quality of life in this densely populated neighborhood. A view of flowering native plants, trees and shrubs along a clean flowing stream, where there was once invasive bush honeysuckle hiding trash, empty liquor bottles and makeshift shelters will, we believe, uplift the neighborhood and change perceptions of the area.

The goats are key to this effort not only because they are environmentally friendly and have voracious appetites for bush honeysuckle, but because they generate community interest and enthusiasm. There is already a positive buzz and excitement in the neighborhood. Residents are excited to volunteer and be with the goats!

Our past efforts, although initially successful, did not engage adequately with the community to forge a sense of ownership and foster long-term volunteer stewardship as seen in other neighborhoods. The use of goats is the key to community engagement resulting in long-term maintenance and the reestablishment of the riparian buffer. We have already seen tremendous interest, support and volunteering in Cardinal Valley and nearby neighborhoods with minimal outreach. Successful use of goat browsers requires their use over multiple seasons. The first season (spring), they will eat all that is green; the second season (fall) they will eat all the regrowth; the third season (spring) they will eat any remaining new growth. The persistence of the goat browsing will render the bush honeysuckle dead, even though the brown branches will remain.

In previous years, while we have employed a contractor to cut back, remove, and treat the invasive, we could not in subsequent seasons keep up with the removal of the regrowth through the use of volunteers. The area is too

steep, the regrowth too vigorous, and the weather too unpredictable for volunteer efforts. The goats like the steep terrain, can get into every nook and cranny, and never tire of eating - rain or shine.

Buffer Browser Schedule

- Spring 2023 - Use of goats for a three-week browsing period.
- Fall 2023 - Use of goats for a three-week browsing period.
- Spring 2024 - Use of goats for a three-week browsing period.

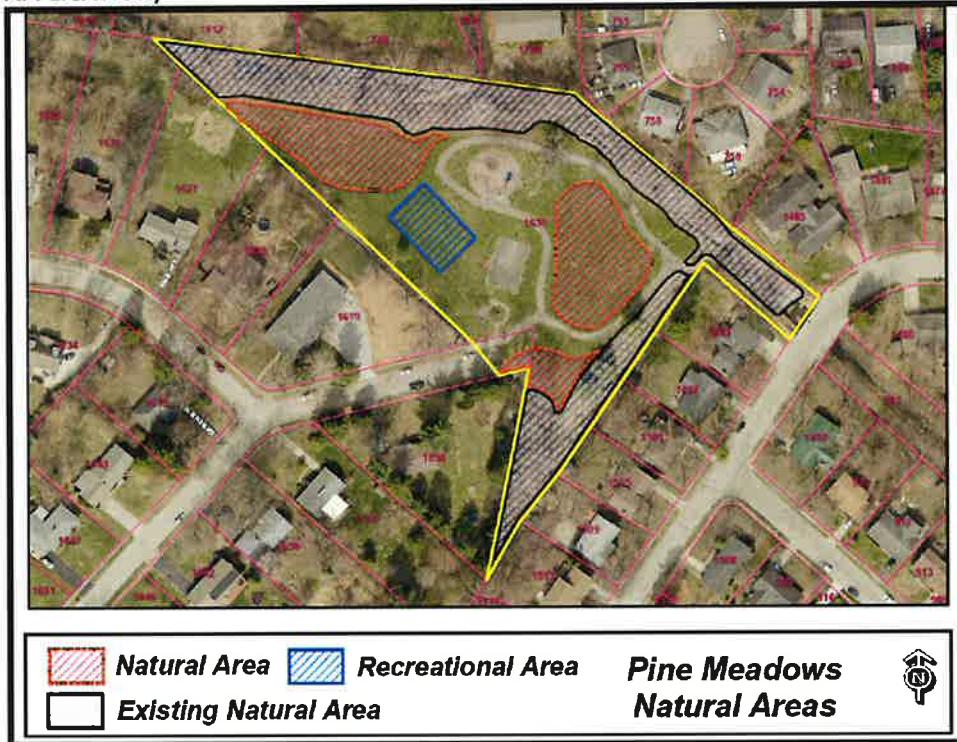
Plan of Work

- Each browsing period will require volunteer efforts as follows:
- Removal of all trash from the area. The entire area but especially the section to be browsed where the goats will be restricted by an electric webbed fence must be kept free and clear of all trash, especially all plastics. This will require daily monitoring.
- Volunteer goat checks up to three times a day in a 24-hr period: Goat wellness and headcount check; electric "live" fence check (volt meter provided).
- An event day will be planned for the project area to be closely scrutinized by volunteers for desirable trees that will be identified and flagged.
- After the goats are removed in Spring 2024, volunteers will remove dead branches while leaving many root systems to allow for stream bank stabilization.
- It is unlikely native species will be planted before Fall of 2024. It is our intention to make the purchase of native flower seeds, shrubs and trees a future grant request.
- There will be a demonstration on "meet the goats" day by David Neville and colleague Al Dilley (who worked his goats at the 2018 Idle Hour location) during each of the 3 browsing seasons.
- Outreach and education on stream bank reforestation will be offered to Cardinal Valley.
- Elementary School in each goat browsing season.
- Outreach for volunteers to "goat wrangle" will also be made to nearby Locust Trace AgriScience Center, 3591 Leestown Road.
- Outreach is ongoing for volunteer "on call" large & small animal veterinarians.
- Outreach is ongoing with Kentucky State University, Dr. Kenneth Andries, PhD., Director of Graduate Programs; Associate Dean, College of Agriculture, Community and the Sciences; Associate Professor, Researcher, and Extension Specialist Small Ruminants.

TABLE 7 – Project Site 5 Budget (FROM APPLICATION)

Line #	Stream Buffer Browsers at Oxford Circle 2023-2024									
1	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
2	Contracted Services	Goatherd David Neville	Site containment setup, Goat delivery, management and support	\$ 3,900.00	Per 3 week browsing session	3	\$ -	\$ 11,700.00	\$ 11,700.00	
3	Area vendors		Trash bags, gloves, pickers, refreshments	\$ 500.00	per project	1	\$ -	\$ 500.00	\$ 500.00	
4	Project Management	Paula Singer, Key Steward	Project coordination	\$ 18.00	Per Hour	50	\$ 900.00	\$ -	\$ 900.00	
5	Professional Services	Kentucky State University	Technical Support, Effectiveness Monitoring Demonstration project	\$ 750.00	per project	1	\$ 750.00	\$ -	\$ 750.00	
6	Signage	Area Vendors	Interpretive signs 24X36" aluminum PVC laminate plus mounting hardware	\$ 150.00	Per Each	2		\$ 300.00	\$ 300.00	
7	Professional Services	Goat Wranglers	Animal management, health checks, containment Checks	\$ 14.50	Per Hour	90	\$ 1,305.00	\$ -	\$ 1,305.00	
8	Project Management	Friends of Wolf Run: Ken Cooke	Processing payments, grant reports.	\$ 18.00	Per Hour	10	\$ 180.00	\$ -	\$ 180.00	
9	Volunteer Time	Community Partners	Cleanup, site visits, educational field days	\$ 7.25	Per Hour	70	\$ 507.50	\$ -	\$ 507.50	
10	TOTAL PROJECT BUDGET:							\$ 3,642.50	\$ 12,500.00	\$ 16,142.50
11								ORGANIZATION SHARE	GRANT SHARE	
12								22.6%	77.4%	
13										

FIGURE 9 – Project Site 6: Pine Meadow Neighborhood Park and Right of Way Buffer Maintenance (FROM APPLICATION)



Project Personnel

Julie Marfell, Key Steward, Pine Meadow Neighborhood Association.

Activity and Outlook

Objectives for this project area are two fold, first is to maintain neighborhood engagement in invasive plant control, native plantings and support for Lexington Parks Bring Back the Bluegrass No Mow Zones in the heart of the park by improving aesthetics with flowering plants.

Maintenance contractors will be engaged for invasive re-sprout control in the Park to include development of a “Natural Resources Management Plan for the buffer zones that follows parks NRMP Formats.

New activities will include support for the Bring Back the Bluegrass public lands naturalization program flowering pollinator garden, specifically requested by Neighborhood Leadership to improve acceptance of zones parks is no longer mowing.

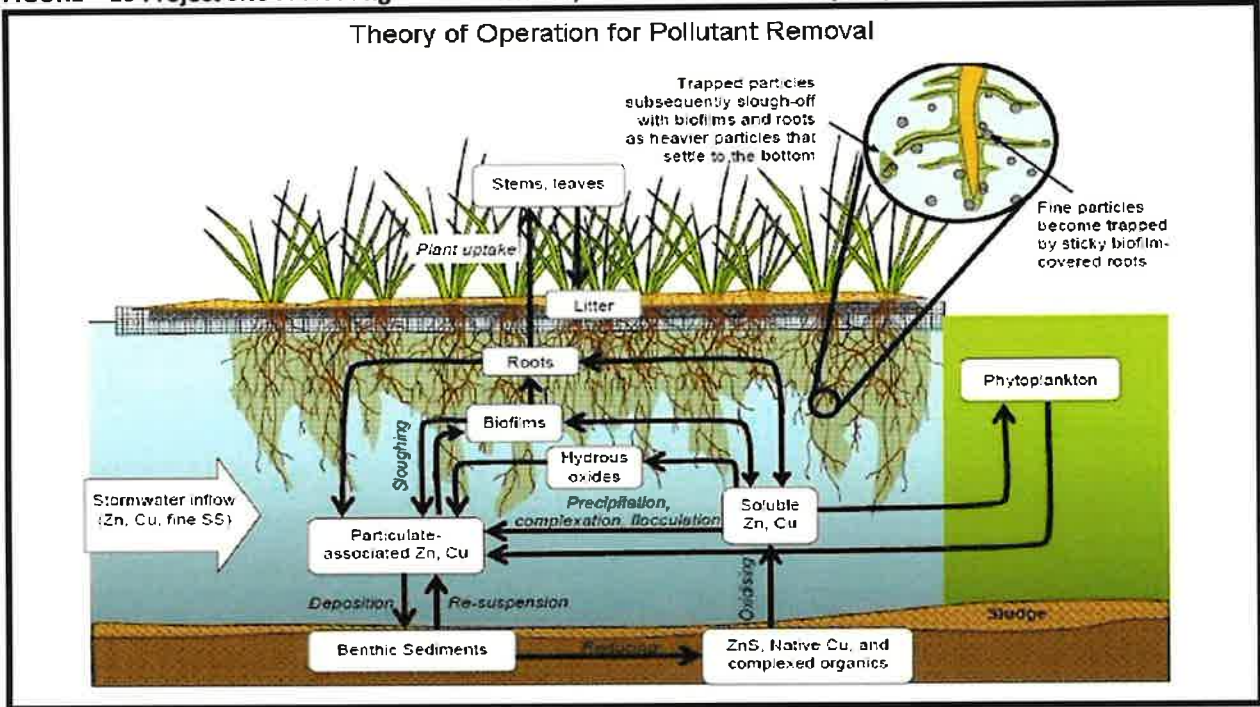
Water Quality Impact. 300 square feet of new buffer, 28,600 Square Feet of buffer maintenance filtering Sediment, nutrients, pathogens and providing temperature Moderation.

Stormwater Volume Impact 14,000 cubic feet of storage from the buffer zone (Per Stormwater Manual).

TABLE 8 – Project Site 6 Budget (FROM APPLICATION)

Line # Pine Meadow Neighborhood Stream Buffer and Spring Restoration 2023-2024										
1	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
2	Volunteer Time	Property owner, Pine Meadow, Community Volunteers	Stream Walks, Volunteer Work Days	\$ 7.25	Per Hour	20	\$ 145.00	\$ -	\$ 145.00	
3	Plant Materials	Area vendors, Nurseries	Trees, Shrubs, Perennial Plants and Seed	\$ 1,200.00	Per Project	1	\$ 200.00	\$ 1,000.00	\$ 1,200.00	
4	Project Management	Key Steward, Pine Meadow Neighborhood	Project organization and administration	\$ 18.00	Per Hour	15	\$ 270.00	\$ -	\$ 270.00	
5	Project Management	Friends of Wolf Run Trustees	Grant Accounting, Purchasing, Financial Administration	\$ 18.00	Per Hour	5	\$ 90.00	\$ -	\$ 90.00	
6	Contracted Professional Services	Will Overbeck, Consulting Plant Ecologist	Management Plan Development	\$800	Per Plan	1	\$ 200.00	\$ 600.00	\$ 800.00	
7	Contracted Professional Services	Will Overbeck, Consulting Plant Ecologist	Invasive Control and Treatment	\$400.00	Per site visit	3	\$ -	\$ 1,200.00	\$ 1,200.00	
8	Materials and landscaping supplies	Area Vendors	Landscaping supplies, mulch, volunteer support materials	\$ 300.00	Per Project	1	\$ -	\$ 300.00	\$ 300.00	
9	TOTAL PROJECT BUDGET:							\$ 905.00	\$ 3,100.00	\$ 4,005.00
10								ORGANIZATION SHARE 22.6%	GRANT SHARE 77.4%	
11										
12										

FIGURE – 10 Project Site 7: Floating Wetland Islands, Solar Pond Aerator Repair (FROM APPLICATION)



Project Personnel

Project Personnel, Steven Rogers, McConnell Spring Park Manager, Bruce Hutcheson, Technician

Activity and Outlook

Friends of Wolf Run and McConnell Springs Park staff will continue operation of two innovative pond management systems that include "Floating Wetland Islands" and maintenance for Solar Powered Pond Aerators.

Water Quality Problem Addressed

Stormwater Retention Ponds are often plagued with nutrient enrichment, algae blooms and low oxygen conditions. Mechanical control measures are expensive, and some pond owners are resorting to chemical controls (using Chelated Copper compounds and "bluestone" copper sulfate to try to control nuisance algae. Application of these chemicals in stormwater quality treatment ponds is against regulation, but private pond owners often resort to use of the compounds.

Project Staff

Friends of Wolf Run and McConnell Springs Park staff propose to continue the operation of two innovative pond management systems that include "Floating Wetland Islands" and maintenance for Solar Powered Pond Aerators. Ken Cooke, Project Coordinator, Bruce Hutcheson, Project Technical Lead and Steven Rogers, Floating Wetland Island Supervisor will manage the effort

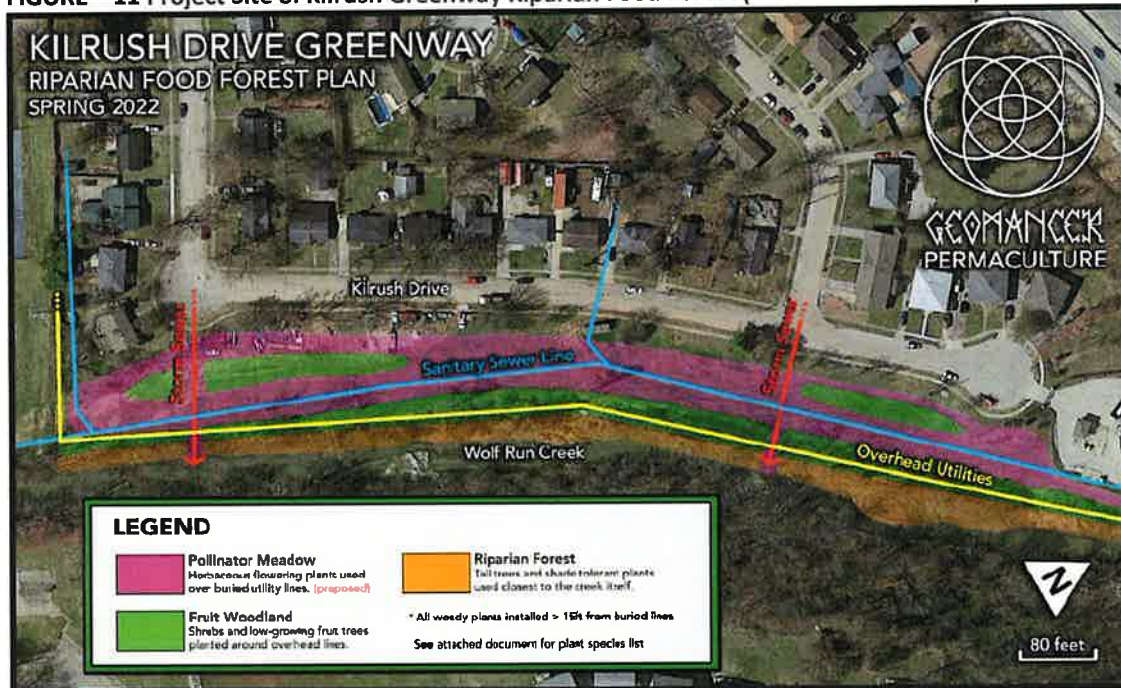
Floating Wetland Island Activities

The team will add two floating wetland islands installed by McConnell Spring Park Pond. The team is also requesting funding for repairing electric motors associated with several solar-powered pond aerators (Replacing armature and seals in the motors after 3-5 years of service for about \$150.00 each)

TABLE 9 – Project Site 7 Budget (FROM APPLICATION)

Line #	Wetland Island and Solar Aeration Maintenance 2023-2024								
	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE	QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
1									
2	Plant Materials	Area Nurseries	Plant materials for floating wetland islands	Per Each \$ 300.00	2	\$ -	\$ 600.00	\$ 600.00	
3	Materials and Supplies	Area Vendors	Anchoring, floatation, plant media repair materials	Bulk Price \$ 400.00	2	\$ -	\$ 800.00	\$ 800.00	
4	Volunteer Time	Floating Wetland Island Operators	Repair, replanting, monitoring and installation	Per Hour \$ 7.25	20	\$ 145.00	\$ -	\$ 145.00	
5	Project Management	Key Steward Steven Rogers	Project management, volunteer supervision, Design	Per Hour \$ 18.00	10	\$ 180.00	\$ -	\$ 180.00	
6	Materials and Supplies	Area vendors	Repair for Solar Pond Aerator Electric Motors	Per Each \$ 150.00	2	\$ -	\$ 300.00	\$ 300.00	
7	Project Management	Friends of Wolf Run	Grant Management, Accounting, Finance	Per Hour \$ 18.00	5	\$ 90.00	\$ -	\$ 90.00	
8	Donated Professional Services	Solar technician Time,	Repair/retrieval of solar pond aerators	Per Hour \$ 25.00	5	\$ 125.00	\$ -	\$ 125.00	
9	Signage	Area Vendors	Interpretive 24X36 aluminum/PVC Laminate Sign describing pond features	Per Each \$ 150.00	2	\$ -	\$ 300.00	\$ 300.00	
10	TOTAL PROJECT BUDGET:						\$ 540.00	\$ 2,000.00	\$ 2,540.00
11	*COST SHARE % =						ORGANIZATION SHARE 21.3%	GRANT SHARE 78.7%	
12	21.26%								
13									

FIGURE – 11 Project Site 8: Kilrush Greenway Riparian Food Forest (FROM APPLICATION)



Project Personnel

Nachie Leandro Braga, Key Steward, Killrush Drive and Cardinal Valley Neighborhood Geomancer Permaculture, LLC, Contractor Invasive Clearing, New "Food Forest Plantings, Education.

Activity and Outlook

Geomancer Permaculture, LLC has been working in the LFUCG greenway along Kilrush Drive since Spring of 2020. Activities to date have included the removal of ~225 linear feet of invasive vegetation along the left bank of Wolf Run Creek and the planting of two dozen native fruit and nut trees and shrubs. Funding for the project has been provided both through the LFUCG Stormwater Quality Projects Incentive Grant Program (WQI) and Neighborhood Development Funds (NDF) distributed by City Council. This proposal provides plans for the extension of this project and ongoing activity by Geomancer in association with the transfer of the LFUCG Encroachment Permit for the Kilrush Drive Greenway to the Valley Park Activities Board, a 501(c) 3 registered nonprofit.

Goals

1. Remove remaining invasive streamside vegetation from Kilrush Drive Greenway.
2. Establish and maintain a multifunctional riparian forest buffer ("permaculture food forest").
3. Utilize site as a public educational resource and example for future installations.
4. Eliminate disturbance to existing utility infrastructure through sound ecological design.

Specifications

All woody trees and shrubs to remain within a minimum of 10' in distance from the center of buried storm and sanitary sewer infrastructure. Species selection to focus on woody perennials traditionally used in native plant agriculture. No-mow zones extending out from the riparian forest buffer will be expanded using existing "hugelkultur" mounds of invasive plant debris. Consideration shall be made for the future expansion of no-mow management throughout the greenway. Geomancer Permaculture, LLC will remain available to conduct public education or other events related to the installation in the future.

Kilrush Riparian Food Forest Plant Schedule

There are hundreds, if not thousands, of plant species suitable to an urban riparian native food forest in the Central Bluegrass. Our intent here is not to provide an authoritative list but rather to establish the intended architecture in each planting zone and demonstrate the capacity for this project to conform to site limitations (e.g. regulatory statutes and utility infrastructure).

Flexibility regarding species selection and availability is appreciated, particularly as we work to expose more of the site that is currently overrun with invasive shrubs. Geomancer Permaculture, LLC shall remain available for consultation on these issues. Planting zones are hierarchical and build off of each other, i.e. plants listed in the *Fruit Woodland* may also be appropriate for the *Riparian Forest*, but not vice versa.

Pollinator Meadow

As this is a speculative planting zone requiring a significant reduction to the existing mow regime in the Kilrush Greenway and the implementation of ecological restoration practices not currently funded by any grant, we do not feel that it is necessary to go into significant detail regarding plant palette at this time. Nevertheless we may use existing LFUCG meadow restoration plantings as precedent such as at Hisle Farm Park or "Bring Back the Bluegrass" sites, as well as "pollinator gardens" at numerous parks and municipal buildings (e.g. the Lexington Family Care Center). Our intention at this time is simply to establish and document a desire to eventually eliminate regular contracted mowing in the Kilrush Greenway. All plantings in this zone will be herbaceous.

Fruit Woodland

- Plum and Cherry (*Prunus spp.*)
- Hazelnut (*Corylus spp.*)
- Elderberry (*Sambucus spp.*)
- Serviceberry/Saskatoon (*Amelanchier spp.*)
- Cane Fruit (*Rubus spp.*)
- Dwarf Chestnut (*Castanea pumila*)
- Groundnut (*Apios spp.*)
- Viburnum (*Viburnum spp.*)
- Aronia (*Aronia spp.*)
- Blueberry (*Vaccinium spp.*)
- Hawthorn (*Crataegus spp.*) *inermis varieties
- Buckthorn (*Rhamnus spp.*)
- Silverbell (*Halesia spp.*)
- Currant and Gooseberry (*Ribes spp.*)
- Hydrangea (*Hydrangea spp.*)
- Dogwood (*Cornus spp.*)
- Beautyberry (*Callicarpa spp.*)
- Allspice (*Calycanthus spp.*)
- Sumac (*Rhus spp.*)

Riparian Forest

- Persimmon (*Diospyros spp.*)
- Mulberry (*Morus spp.*)
- Sugarberry (*Celtis spp.*)
- PawPaw (*Asimina spp.*)
- Basswood (*Tilia spp.*)
- Hickory and Pecan (*Carya spp.*)
- Walnut (*Juglans spp.*)
- Sycamore (*Platanus spp.*)
- Tulip Poplar (*Liriodendron spp.*)
- Oak (*Quercus spp.*)
- Chestnut (*Castanea spp.*)
- Willow (*Salix spp.*)
- Locust (*Gleditsia and Robinia spp.*)

TABLE 10 – Project Site 8 Budget (FROM APPLICATION)

Line #	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE	QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
2	Contracted Professional Services	Geomancer Permaculture	Follow up treatment/removal of invasive plants along left bank of Wolf Run	\$ 1,500.00 per acre	2	\$ -	\$ 3,000.00	\$ 3,000.00	
3	Contracted Professional Services	Geomancer Permaculture	Site preparation, plant installation	\$ 1,500.00 per acre	2	\$ -	\$ 3,000.00	\$ 3,000.00	
4	Materials and landscaping supplies	Area Vendors delivered by Geomancer Permaculture	Mulch, markers, equipment rental, tools and volunteer support materials	\$ 2,000.00 per project	1	\$ -	\$ 2,000.00	\$ 2,000.00	
5	Plant Materials	Geomancer Permaculture	Native plant materials, primarily fruit and nut bearing species	\$ 4,500.00 per project	1	\$ 500.00	\$ 4,000.00	\$ 4,500.00	
6	Donated Professional Services	Geomancer Permaculture	Site evaluation and design	\$ 1,000.00 Per Plan	1	\$ 1,000.00	\$ -	\$ 1,000.00	
7	Donated Professional Services	Geomancer Permaculture	site visits over the course of the next year to assist in establishment and maintenance	\$ 500.00 Per site visit	3	\$ 1,500.00	\$ -	\$ 1,500.00	
8	Project Management	Cardinal Valley Parks Activities Board	Will Anglin, Site Supervisor/Neighborhood Liaison	\$ 18.00 Per Hour	20	\$ 360.00	\$ -	\$ 360.00	
9	Project Management	Friends of Wolf Run Trustees	Financial Management, Disbursements, Finance	\$ 18.00 Per Hour	10	\$ 180.00	\$ -	\$ 180.00	
10	TOTAL PROJECT BUDGET:						\$ 3,540.00	\$ 12,000.00	\$ 15,540.00
11							ORGANIZATION SHARE	GRANT SHARE	
12	*COST SHARE % =					22.78%	22.8%	77.2%	
13									

FIGURE 12 – Project Site 9: Tobit’s Trace Spring Garden: St. Raphael’s Episcopal Church on Cardinal Run (FROM APPLICATION)



Project Personnel

Laurie Daugherty, Key Steward assisted by Skybox Ecological Services, Contractor

Activity and Outlook

The project at the rear of the property owned by St. Raphael’s Episcopal Church that adjoins the Colony Neighborhood contains a tributary to Cardinal Run that makes its way to what is known as “Blue Hole”. We were awarded a series of grants to clear out invasive plant material like honeysuckle and poison hemlock and create a more natural stream bed feature to use for walking trails, and replant of native flowering, fruit and nut bearing trees, shrubs, and plant materials.

Web Based Outdoor Educational Experience

Stream cleanup is just one aspect of this project as a community feature. St. Raphael’s approved grants include a contemplative educational walking trail thru this area connecting the rear acreage of the site to our existing

campus. We have plenty of parking and by opening ourselves to the neighborhood, they can easily experience the site on a frequent basis.

The Request

Since the bush honeysuckle (*Lonicera maackii*) has been removed in this area, it has been replaced by a variety of native plants. Some of the most challenging to control are winter creeper (*Euonymus fortunei*) and poison hemlock (*Conium maculatum*). However, continued efforts are reducing these species. In addition, there are some native species that are not aesthetically pleasing in this area; pokeweed (*Phytolacca americana*), southern blackberry (*Rubus argutus*), and summer grape (*Vitis aestivalis*).

Currently, this area is cut to 6 to 8 inches in the late summer or early fall. We are proposing to seed in some native grasses and forbs that should compete well with the existing species and look better as well. The primary grass would be Virginia wild rye (*Elymus virginica*), but also include purpletop grass (*Tridens flavus*), deertongue (*Panicum clandestinum*), fall panicum (*Panicum anceps*), and fox sedge (*Carex vupinoidea*). Forbs would include Illinois bundleflower (*Desmanthus illinoensis*) and bergamot (*Monarda fistulosa*).

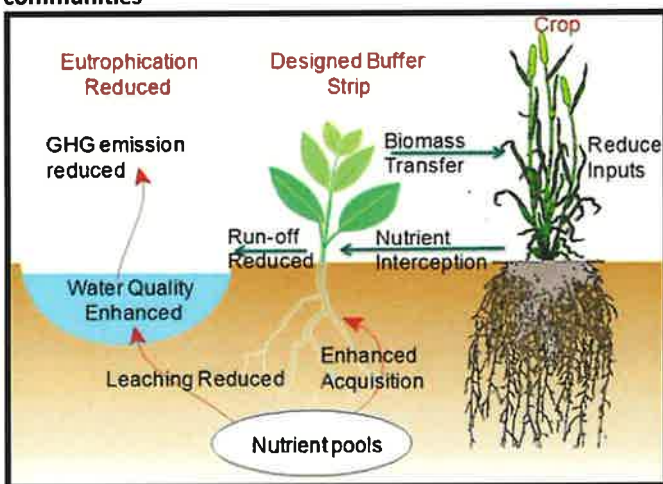
The area will still require mechanical cutting. Like the wildflower meadow, it should be cut twice a year for the best results. Spot treatments, herbicide and/or mechanical removal, of specific plants should be done every month throughout the growing season.

The proposed herbaceous layer restoration will increase the diversity of native plant species, reduce the abundance of non-native plants, as well as achieve a better aesthetic for this area.

TABLE 11 – Project Site 9 Budget (FROM APPLICATION)

Line	Tobits Trace Stream Trail Maintenance 2023-2024			UNIT PRICE	QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE	
1	TYPE OF EXPENSE	PARTICIPANTS	ITEM						
2	Contracted Services	Bids/Skybox	Treat and remove resprouts in previously cleared areas	\$ 120.00	Per treatment	8	\$ -	\$ 960.00	\$ 960.00
3	Plant Materials	Bids/Skybox	Seed (Native Grasses Forbs)	\$ 800.00	Per Project	1	\$ -	\$ 800.00	\$ 800.00
4	Native Grasses and Forbs	Bids/Skybox	Seed installation	\$ 1,600.00	Per Project	1	\$ -	\$ 1,600.00	\$ 1,600.00
5	Contracted Services	Bids/Skybox	Keeping perimeter/fence line mowed of wildflower field and trail maintenance	\$ 240.00	Per time	4	\$ 600.00	\$ 360.00	\$ 960.00
6	Volunteer Time	St. Raphael Church	Follow-up control of honeysuckle/weeds; planting; mulching	\$ 7.25	Per Hour	32	\$ 232.00	\$ -	\$ 232.00
7	Project Management	Laurie Daugherty, Key Steward	Grant Accounting, Purchasing, Financial Administration	\$ 18.00	Per Hour	5	\$ 90.00	\$ -	\$ 90.00
8	Project Management	Ken Cooke/Friends of Wolf Run	Key Steward Event Coordination, volunteer organization and planning	\$ 18.00	Per Hour	5	\$ 90.00	\$ -	\$ 90.00
9	TOTAL PROJECT BUDGET:						\$ 1,012.00	\$ 3,720.00	\$ 4,732.00
10							ORGANIZATION SHARE	GRANT SHARE	
11							21.4%	78.6%	
12	*COST SHARE % = 21.39%								

FIGURE 13 – Project Element 10: Evaluating forested riparian buffer effects on soil carbon and microbial communities



Project Personnel

Kenton Sena (PI), Lecturer, Lewis Honors College, Luke Moe (Co-PI), Associate Professor, Dept. of Plant and Soil Sciences, and Amanda Gumbert, Water Quality Specialist, UK Extension.

Activity and Outlook

Our soils are at the root of it all when it comes to the effectiveness of riparian buffers in reducing pollutants, infiltrating stormwater and providing for a robust plant community. This project element is designed to improve our ability to evaluate and upgrade urban soils to better support green solutions to urban stormwater problems.

This project element will focus on soil health characteristics in riparian areas planted as part of stream buffer restoration efforts examining UK campus sites and a series of riparian sites along Wolf Run. These analyses will permit evaluation of soil carbon and microbial community development in riparian buffer soils.

Project Background

Urbanization drives negative impacts to forests and streams (Walsh et al. 2005; Vietz et al. 2016), reducing forested area and fragmenting forests (Fuller, 2001), increasing impervious surface area (Morse et al. 2003), altering stream channels, disconnecting streams from floodplains (Walsh et al. 2005), disrupting riparian communities (Groffman et al. 2003), and compromising soil health (Yang and Zhang, 2015). In addition, ongoing environmental effects of high population density, such as air (Honour et al. 2009) and water pollution and invasive species introductions (Burton et al. 2005), further threaten ecosystem health over time.

Riparian buffers have been emphasized as an important tool for recovering some of the lost ecosystem structure and function along streams, particularly in agricultural settings; however, much work remains to be done to characterize their effectiveness in urban settings.

For example, Bharati et al. (2002) reported significantly reduced bulk density and increased infiltration rates in riparian buffer soils compared to pasture and field soils, suggesting that riparian buffers can enhance stormwater management and flood mitigation through enhanced infiltration. Furthermore, Addy et al. (1999) and Mayer et al. (2007) noted that riparian buffers are effective at removing nitrate (with wider buffers even more effective than narrow buffers).

In addition to these important water quality and hydrology benefits, riparian buffers have also been found to improve soil health by improving soil microbial diversity, with microbial communities in reforested riparian areas approximating microbial communities in reference forests in some ways (Mackay et al. 2016). However, in some cases, reconstruction activities associated with stream and riparian restoration can increase riparian soil compaction significantly enough to impede plant growth (Laub et al. 2013), illustrating the importance of evaluating soil health in riparian buffers.

Finally, soil microbes play key roles in the function of soils, and shifts in microbial community structure can impact ecosystem services such as those involved in nutrient cycling (e.g. nitrogen, phosphorus), as well as carbon sequestration. These functions play key roles in the health of riparian and downstream ecosystems.

In this case, we hypothesize that changes in land use from mowed or agricultural land use to unmowed forested buffer will be associated with microbial community shifts increasing functions such as denitrification, as well as increased overall diversity.

Project Description

In Lexington, KY, a number of stream reaches have been protected with riparian buffers over the past several decades, including riparian areas planted as part of Reforest the Bluegrass, conservation easements along Wolf Run managed by the community organization Friends of Wolf Run, and recent stream restoration sites on the University of Kentucky campus.

The proposed project will use these sites to characterize:

1. Above ground riparian buffer condition,
2. Soil bulk density and carbon content in riparian buffers compared to adjacent land, and
3. Soil microbial biomass and diversity in riparian buffers compared to adjacent land.

Objective 1: Characterize soil bulk density, texture, and carbon in conservation riparian buffers and adjacent mowed land.

These data will support a robust assessment of the effects of riparian buffers on soil compaction and carbon, including a comparison between buffers and adjacent land use. These analyses will contribute to our understanding of the role of riparian buffer soils in carbon storage, with implications for climate change mitigation.

Objective 2: Characterize soil microbial diversity in conservation riparian buffers and adjacent mowed land.

These data will support a robust assessment of the effects of riparian buffers on soil microbial communities, with a comparison between riparian buffers and adjacent land use. These analyses will contribute to our understanding of the role of riparian buffers in improving soil health by way of altered soil microbial diversity.

Duration of Project

July 2023

- Collect soil samples for bulk density, texture, carbon, and microbial analyses
- Process and send samples to UK Regulatory services for texture and carbon analyses

Fall semester 2023

- Extract and sequence DNA

Winter 2023 / 2024

- Present / participate in Friends of Wolf Run stewards meeting, with UK Water Quality Extension partners

Spring semester 2024

- Conduct metagenomic analyses
- Analyze soil carbon, texture, bulk density, and microbial community data
- Analyze riparian health assessment data

Summer 2024

- Prepare manuscript and presentation

Fall 2024

- Provide Final report to LFUCG Division of Water Quality

Approach and Methodology

The proposed project will characterize vegetation and soil in a number of restored riparian buffer sites in Lexington, KY

TABLE 12 – Approach and Methodology Plan (FROM APPLICATION)

Site	Stream	Year Planted	Manager
Roanoke Greenway	Wolf Run	2006	Friends of Wolf Run
Elm Fork Restoration	Vaughn’s Branch	2015	University of Kentucky
Kilrush Greenway	Wolf Run	(Underway)	Valley Park Board
Lone Oak Greenway	Wolf Run	2014	Friends of Wolf Run

Work Methods

Objective 1: Characterize bulk density, texture, and carbon in conservation riparian buffers and adjacent mowed land.

For each metric, three pairs of samples will be collected per site, with each pair including a sample approximately in the middle of the buffer (between streambank and buffer edge) and a sample 5 m from buffer edge outside the buffer. This represents 6 sampling points per site x 4 sites.

Task 1.1: Using bulk density rings, sample soil bulk density in 5 cm increments from 0 – 15 cm.

Bulk density measurements will follow standard procedure—the ring allows extraction of a standard volume of soil, which can be oven dried and weighed. Bulk density will be calculated in g/cm³ by dividing soil weight by soil volume. Bulk density rings will be borrowed from Barton Lab, UK Department of Forestry and Natural Resources (DFNR).

Task 1.2: Using a sampling spade, sample soil in 5 cm increments from 0 – 15 cm for texture and carbon analysis. Soil samples will be analyzed for texture and soil carbon by the UK Regulatory Services Soils Lab, using standard methods.

Objective 2: Characterize soil microbial community diversity in conservation riparian buffers and adjacent mowed land. Equipment necessary for tasks 2.1 and 2.2 will be borrowed from Barton Lab, UK DFNR. Samples for Objective 3 will be collected using a sampling spade from the top 15 cm of the soil profile at the sampling points described for Objective 2 above.

Task 2.1: Assess soil microbial community diversity: Metagenomic methods will be used to characterize microbial community structure in soil samples, and to identify shifts in community structure and function according to shifts in land use. Briefly, DNA will be extracted from 0.5g soil from the top 15cm of soil samples collected as described above using the MoBio PowerSoil DNA extraction kit. DNA will be quantified, and the V4 region of 16S rRNA genes will be amplified by PCR using indexed PCR primers according to Kozich, et al. This allows for collective amplification of all 16S rRNA genes from each sample. The PCR amplicons will be normalized to account for differences in concentration and sequenced using one Illumina MiSeq run at the University of Kentucky Healthcare Genomics Center. Data will be processed using the freely available Mothur software pipeline (Schloss et al), which allows for measurements and visualization of alpha- and beta-diversity measures. Community structure will be compared between samples to identify shifts and to infer differences in relevant microbial functions according to land use. Data will be correlated with soil chemical, biological, and physical measurements using the R statistical software package to identify key features driving shifts in soil function.

Statement of benefits and key outcomes

- Manuscript reporting on riparian buffer plant community and soil health: The proposed project will generate a significant dataset (including plant community metrics, soil physical and chemical metrics, and soil microbial diversity metrics) which will support preparation of a manuscript focused on the effectiveness of riparian buffers for enhancing soil health in an urban setting. This manuscript will be prepared for submission to a journal such as *Urban Forestry and Urban Greening*, *Urban Ecology*, or *Soil Science Society of America Journal*.
- Soil Health Data: The project team includes researchers, educators, and community members, and thus presents an important opportunity to directly connect research results (e.g., data regarding soil health under riparian buffers) to practice (e.g., conservation efforts planned by Friends of Wolf Run).
- Workshops: The project team includes representatives from UK Water Quality Extension, who will help coordinate workshops to report project results to relevant community stakeholders through a workshop.

- Student Engagement and Training Potential: The proposed project requests support for an undergraduate student intern, who will assist the project team in collecting, processing, and analyzing soil samples, as well as drafting the project manuscript and presentation.
- Future partnerships for promoting soil health, assessments and restoration: Soils are at the root of all our natural landscape designs for green infrastructure. By assembling the project team and having direct local research on the topic, we can expand our service, extension and study opportunities in the future.

TABLE 13 – Project Site 10 Budget (FROM APPLICATION)

Evaluating Riparian Buffer Soils (at the root of it all!) 2023-2024									
Line	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE
2	Contracted Services	Dr. Kenton Sena/Student Intern	Sample collection, data analysis, reporting	\$ 1,750.00	Per Site	4	\$ 1,800.00	\$ 5,200.00	\$ 7,000.00
3	Laboratory Analysis	UK Research Services	sample analysis and supplies	\$ 2,200.00	Per Project	1	\$ -	\$ 2,200.00	\$ 2,200.00
4	Project Management	Friends of Wolf Run	Processing payments, grant reports	\$ 18.00	Per Hour	10	\$ 180.00	\$ -	\$ 180.00
5	Volunteer Time	Community Partners	Participation in workshops and field days	\$ 7.25	Per Hour	20	\$ 145.00	\$ -	\$ 145.00
TOTAL PROJECT BUDGET:							\$ 2,125.00	\$ 7,400.00	\$ 9,525.00
							ORGANIZATION SHARE 22.3%	GRANT SHARE 77.7%	
*COST SHARE % = 22.31%									

FIGURE 14 – Project Element 11: Overall Project Administration (FROM APPLICATION)



Project Personnel

Ken Cooke, Project Administrator, Friends of Wolf Run, Friends of Wolf Run Board of Trustees

Friends of Wolf Run leadership will provide general project coordination including:

1. Production and supply of educational signage for stream restoration sites and commercial sites adjacent to the waterway.
2. Providing no-mow zone markers for project areas.
3. Distribution to key stewards and neighborhood leadership publications related to stream buffer science, installation and maintenance. (Living Along A Kentucky Stream).
4. Outreach and communication regarding specific project work days, tours and events through social media, website email distribution and printed flyers.
5. On-site field support for Key Stewards, organizing meetings and planning sessions with property owners, city officials and volunteer leadership.
6. Specific coordination of Herbicide Applicators Certification through the Kentucky Department of Agriculture Division of Pesticide Regulation. At least one certified herbicide applicator is assigned to each project area. The project covers the testing fee and certification fee for the Key Steward or his/her designated project representative.
7. Making financial arrangements, purchasing coordination, accounting, grant reporting and record keeping for the overall project.
8. Project long-range planning for future funding and alternative funding sources for grant match and new development.

TABLE 14 – Project Element 11 Budget (FROM APPLICATION)

Administration and Coordination Council Districts 2, 3, 10 and 11.									
Line #	TYPE OF EXPENSE	PARTICIPANTS	ITEM	UNIT PRICE		QUANTITY	FUNDED BY ORGANIZATION	FUNDED BY GRANT	TOTAL EXPENSE
2	Signage	Friends of Wolf Run Trustees	No Mow Zone Boundary Markers, Stickers and polls	\$11.00	Per Each	50	\$ -	\$ 550.00	\$ 550.00
3	Printing	Friends of Wolf Run Trustees	Printing, meeting handouts, Extension Publications	\$800	Per Campaign	Variable	\$ 500.00	\$ 300.00	\$ 800.00
4	Internet Information Services	Friends of Wolf Run Trustees	Social Media and Web Site Operations	\$ 500.00	Per Campaign	1	\$ 500.00	\$ -	\$ 500.00
5	Field Day	Friends of Wolf Run Trustees	Field Trip for Project Participant and Key Stewards	\$250	Per Event	2	\$250.00	\$ 250.00	\$ 500.00
6	Educational Signage	Area Vendors	Design, Printing and installation	\$800	Per Unit	1	\$ -	\$ 800.00	\$ 800.00
7	Project Management	Friends of Wolf Run Trustees	Grant Accounting, Purchasing, Financial Administration	\$ 18.00	Per Hour	80	\$ 1,440.00	\$ -	\$ 1,440.00
8	TOTAL PROJECT BUDGET:						\$ 2,690.00	\$ 1,900.00	\$ 4,590.00
9							ORGANIZATION	GRANT	
10	*COST SHARE % = 58.61%						SHARE	SHARE	
11							58.6%	41.4%	

Stormwater Quality Projects Incentive Grant Program

