

MEETING NOTES
of the
STORMWATER STAKEHOLDER ADVISORY COMMITTEE (SSAC)
Lexington-Fayette Urban County Government (LFUCG)

Meeting: September 9, 2022
Time of Meeting: 9:00 a.m.
Location of Meeting: Phoenix Building – 3rd Floor Conference Room

Attendees:

COMMITTEE MEMBERS

Eileen Burk – Kentucky River Watershed At-Large
Doug Burton – LFUCG Division of Engineering
Jennifer Carey – LFUCG Division of Environmental Services
Jim Conner – Cane Run Watershed At-Large
Ken Cooke – Friends of Wolf Run
Amanda Gumbert – Friends of Cane Run
Don Hill – Fayette County Neighborhood Council
Elizabeth McGee Lewis – Friends of McConnell Springs
Tresine Logsdon – Fayette County Public Schools
Charlie Martin – LFUCG Division of Water Quality
Tom Martin – LFUCG Division of Planning (for Jim Duncan)
Mary Murray – Federal Facilities, Lexington VHA Medical Center
Meredith Price – Lexington-Bluegrass Association of Realtors
Scott Smith – Commerce Lexington
Amy Sohner – Chair, Bluegrass Greensource
Jason Unrine – Kentucky Water Resources Research Institute (for Steve Evans)
Jerry Weisenfluh – Kentucky River Watershed Watch
Jack Wilson – South Elkhorn Watershed At-Large

LFUCG STAFF AND REPRESENTATIVES

Denice Bullock – LFUCG Division of Water Quality
Jeffinisha Cobb – LFUCG Division of Water Quality
Sarah Donaldson – LFUCG Division of Environmental Services
Gabe Hensley – LFUCG Division of Water Quality
Becky Irwin – LFUCG Division of Water Quality
Greg Lubeck – LFUCG Division of Water Quality
Frank Mabson – LFUCG Division of Water Quality
Demetria Kimball Mehlhorn – LFUCG Division of Environmental Services
Jennifer Myatt – LFUCG Division of Environmental Services
Lindsie Nicholas – LFUCG Division of Water Quality
Angela Poe – LFUCG Division of Environmental Services
Abby Terry – Tetra Tech, LFUCG MS4 Program Management
Richard Walker – Tetra Tech, LFUCG MS4 Program Management
Heather Wilson - LFUCG Division of Environmental Services

OTHER ATTENDEES

Ken Johnson – Citizen
Brad Lee – UK Cooperative Extension Service
Sam Lee – Stantec
Malissa McAlister – Kentucky Water Resources Research Institute
Peyton Mills – Lewis Honors College, University of Kentucky
Kenton Sena – Lewis Honors College, University of Kentucky
Mike Woolum – Strand Associates

Opening Remarks

Amy Sohner opened the September meeting at 9:00 a.m. and asked those attending to share their name and organization when speaking.

Approval of 06/03/2022 Minutes

Ms. Sohner asked if there were any additions or corrections to the minutes. There were none.

A motion was made by Jennifer Carey; seconded by Eileen Burk, and carried unanimously to approve the minutes of the June 3, 2022, meeting.

Greenspace Trust: Partnering with the Community to Improve Underutilized Greenspaces

Demetria Kimball Mehlhorn, Division of Environmental Services, gave a synopsis of the LFUCG Greenspace Trust's mission to work with the community to transform open spaces into Neighborhood Greenspaces.

Ms. Kimball Mehlhorn spoke about the evolution of the LFUCG Greenspace Trust. She explained that the LFUCG Greenspace Commission was established in 1990, under the Division of Planning, as a citizen-based advisory group to look at the county's unique environmental aspects. In 2018, the Greenspace Commission was moved from the Division of Planning to the Division of Environmental Services. In 2002, the LFUCG Greenspace Trust was created by LFUCG Ordinance as a 501(c)(3) non-profit corporation. The Ordinance allowed the acceptance of grant funding and donations, as well as holding the easement for the Coldstream Supplemental Environmental Project, pursuant to the Consent Decree with the EPA. In 2022, the Greenspace Commission and Greenspace Trust were combined under one Ordinance, creating the LFUCG Greenspace Trust.

Ms. Kimball Mehlhorn briefly explained that DES maintains 290 parcels that are owned by the City of Lexington. These lots total 105 acres that include water quality flooding lots, LFUCG owned and maintained detention basins, small greenways developers deeded, environmentally sensitive areas, and many open lots in neighborhoods without adequate park access, as well as small remnant pieces spread throughout the county. Some examples of relevant parcels include Kilrush Drive, Furlong Drive, and Deauville Drive.

Ms. Kimball Mehlhorn provided The Model used to convert the Underutilized Greenspaces as follows:

1. Choose Focus Greenspace
2. Conduct Site Assessment
3. Brainstorm Design Concepts
4. Public Meeting
5. Refine Design
6. Public Meeting
7. Finalize Design & Phases
8. Pursue Funding
9. Implement Design (Phases)
10. Celebrate Vibrant, Improved Neighborhood Greenspace
11. Provide Ongoing Maintenance
12. Evaluate Process & Repeat with a new Focus Greenspace

The idea is to take some of these underutilized areas and create a vibrant gathering place in the community with an eye towards water quality improvement. DES already has a maintenance program for greenspaces and is able to absorb these areas under that program. Ms. Kimball Mehlhorn presented Dantzler Court as the first project completed under this Model:

Dantzler Court, Water Quality Buyout lot

- Funds Received / Committed -- \$16,000
 - \$1,000 - LFUCG Neighborhood Development Funds (FY 2019) (Phase I)
 - \$2,500 - Bluegrass Community Foundation (FY 2020) (Phase I)
 - \$10,000 - LFUCG Discretionary Funds (FY 2020) (Phase II)
 - \$2,500 - LFUCG Discretionary Funds (FY 2021) (Phase III)
- Phase I-A, June 2019
 - Bench purchased (June 2019)
- Phase I-B, Spring 2020:
 - Invasive removal/herbicide applied
 - Ten (10) trees were purchased & planted
 - Public meeting September 2020

- Phase II, Spring 2021:
 - Adventure garden installation
 - Bench & safety gate installation
 - Stream buffer & wildflower border planted
 - Educational signage
- Phase III, Summer 2021:
 - Bicycle rack installed
 - Geocaching station developed
 - Ribbon cutting September 28, 2021

Ms. Kimball Mehlhorn emphasized how eager the Greenspace Trust and staff were to find the next project which initiated the Eureka Springs detention basin (1980s). The transformation went as follows:

- Site Assessment - August 2021
- Public Meeting - October 2021
- Public Meeting - March 2022
- Ribbon Cutting – September 2022
- Budget: \$25,000 Council Extra Bond Funds
- Passive wet meadow area where people can stop and enjoy the wildlife refuge pollinator garden, installed a bench, planted trees, and installed educational signage

Ms. Kimball Mehlhorn then noted the preliminary design progress thus far for the Cane Run Greenway - Council District 1.

- The 1st Public Meeting held on Wednesday, June 15, 2022
- The Cane Run Greenway will be broken into smaller projects with stream work, wet meadows, and passive play areas

Ms. Kimball Mehlhorn indicated that going forward the following will be used when applying the model:

- **Themes to continue:**
 - Looking for opportunities to use green infrastructure for water quantity and quality management
 - Making greenspace accessible and equitable
 - Emphasizing connectivity where possible and needed (5-minute and 10-minute walk / ride radius, linking parks / greenspaces / trails to neighborhoods and to each other)
 - Improving vacant / underutilized greenspace to provide vibrant focal points within neighborhoods with relatively small infusions of funding makes a significant impact
- **Things Learned**
 - Don't rush the design and public meetings
 - Create a design that can be implemented in phases and/or various money options
 - Listen to the neighbors
 - Keep it simple

Questions and comments

Amy Sohner, Bluegrass Greensource, said that parks and greenspaces are similar but different, and asked if DES was partnering with Parks & Recreation. Ms. Kimball Mehlhorn replied that Environmental Services and Parks & Recreation are working together on different projects, but even though there are open areas in a park, Parks & Recreation considers a park a programmed space, so that is the definitive difference, e.g. open soccer fields or play structures.

Jack Wilson, South Elkhorn At-Large, commented on the difference between Eureka Springs a year ago versus what it looks like today. Ms. Kimball Mehlhorn said that Eureka Springs was a hole in the ground; it was uninviting, and there was standing water. The staff has worked hard on changing Eureka Springs by planting twenty-one (21) trees along the roadway and within the basin. Eureka Springs is now a wet meadow full of color. She said that Eureka Springs is on a city maintenance contract and will be maintained in perpetuity as long as the City keeps it in the budget.

Malissa McAlister, Kentucky Water Resources Research Institute, remarked that there are many other applications where the model would be useful in larger communities, but would need to be adjusted for smaller communities. Ms. Kimball Mehlhorn

agreed, and mentioned that involving a non-profit can help. If there is not a non-profit organization in the community, the staff works closely with several non-profit organizations that could assist that community with Section 501(c)(3) non-profit status.

Ken Cooke, Friends of Wolf Run, commented that a person may have the know-how but the question is will they have the local ordinances to make it feasible. He indicated that a community that uses funds that FEMA allocates through its Hazard Mitigation Grant Program to purchase properties would be an excellent candidate for this model. This would be an excellent way to share the model with other communities. Ms. Kimball Mehlhorn reiterated the staff is working with smaller budgets. The Dantzler Court budget was \$16,000.00 and funding was derived from several different sources. The Eureka Springs budget was \$25,000.00 and the Cane Run budget was between \$10,000.00 and \$15,000.00.

Mr. Wilson noted that it seems as if the Greenspace Trust is the drive in the selection process, as opposed to the community. He asked if there are existing studies or documents regarding how a potential lot is classified and whether it is useable. Ms. Kimball Mehlhorn answered that the staff is currently working on a master study, but if there is a particular area of interest, to reach out to the DES staff who in turn can bring those discussions to the Greenspace Trust for an evaluation. There is not one particular area the Greenspace Trust focuses on but rather the lot needs to be obtainable to implement a project.

Mr. Cooke indicated that this is an excellent model and appreciated the Greenspace Trust in their efforts. However, due to the two (2) year timeframe, from start to finish, it would take 400 years to complete 290 properties. He asked if there was a way to replicate the process with other parties, such as neighborhood associations, who can propagate the model in a certain way for their local areas. He then asked if the Greenspace Trust would be willing to authorize, sponsor or sanction this type of activity. Ms. Kimball Mehlhorn replied that the staff could present those discussions to the Greenspace Trust but the Models designed have been refined over each project since the beginning. Mr. Cooke said that each project gives that real-world experience where you can then govern and guide the other entities.

Mr. Cooke asked if there is a process for the Greenspace Trust to identify abandoned properties and can those properties be taken under government control. Ms. Kimball Mehlhorn responded not at this time and added that 290 LFUCG-owned parcels are the main focus of the Greenspace Trust. Charlie Martin, Director of Water Quality indicated that the city deals with abandoned properties a lot. These properties are under a ghost corporation or individual that has been deceased. The Secretary of State's Office deemed the owner as non-existent, so there is no conclusion and it is difficult when encountered. Mr. Cooke added that it is a recurring issue for there to be no property owners listed with the Property Valuation Administration (PVA) and it is problematic to maneuver.

Meredith Price, Lexington-Bluegrass Association of Realtors, queried how is the ownership identified, and asked if it is owned by LFUCG. Ms. Kimball Mehlhorn answered these are platted parcels owned by the City of Lexington. Ms. Price proceeded to ask if there is a way to identify which Division is associated with a parcel. Ms. Kimball Mehlhorn said it is not easy for a citizen to identify but the Divisions work together to identify who maintains the parcel.

Mr. Smith asked why the City cannot take the abandoned properties. Ms. Kimball Mehlhorn recommended that the question be addressed by the Law Department. Tom Martin, Division of Planning, said that abandoned property can be seized through condemnation of property.

Mr. Cooke asked what it cost per parcel after the declarative judgment is issued, and the required surveys and paperwork are completed. Ms. Kimball Mehlhorn said that when the City takes ownership of a property, the staff does their best to keep those properties maintained and to stay within the budget. Mr. Smith said that it sounds like an excuse and addressing abandoned property should not be an afterthought. He also touched on possible delinquent taxes and designating responsibility.

Mr. Tom Martin said that the word condemnation has a negative connotation and politicians don't like to use it if they don't have to. He gave an example of a public road project that took years because the government would not condemn a piece of property for the right-of-way.

Mr. Smith said that abandoned properties are standing in the way of good projects. This should be placed on someone's radar making it a priority to obtain that needed property. Ms. Kimball Mehlhorn said that she understood, but DES already maintains 290 parcels.

Urban Riparian Reforestation for Stormwater Quality Improvement

Kenton Sena and Peyton Mills, Lewis Honors College, University of Kentucky, gave an overview of Ecological Impacts caused by Urbanization including reduced infiltration and increased runoff, shifts in hydrology, stream channel instability and stream disconnection from floodplain, and sedimentation and other water quality issues from increased runoff.

Mr. Sena discussed Urban Reforestation as a potential partial solution and early attempts to monitor the water quality at the reforest sites and note any effects. At the beginning of 2020, the preliminary sampling suggested a reduction of nitrate just as the stream passed through the reforested reach in several of the sites. This was an interesting finding to the staff and they decided to request additional funding through KWRRI to expand the scope of the project.

Mr. Sena noted that sections of the stream restoration project including Wolf Run and a few sites along Alumni Drive were added to the study. Study sites included:

Locations	Restoration Year	Restoration Type	Watershed	Area Reforested(m²)	Reach Length(m)
Masterson Station Park	2000	Reforestation	Town Branch	40,286	892.7
Ribbon Park	2010	Reforestation	West Hickman	14,542	398.07
West Hickman Creek	2003	Reforestation	West Hickman	13,123	241.07
Tributary to Hickman Creek	2003	Reforestation	West Hickman	12,746	267.03
Alumni Drive East	2015	Reforestation and stream reconstruction	Wolf Run	4,017	259.26
Alumni Drive West	2015	Reforestation and stream reconstruction	West Hickman	3,494	167.43
Wolf Run	2010	Various Conservation Activities	Wolf Run	57,436	2,048.1

Mr. Sena added that in the Reforest the Bluegrass sites only trees were planted in the riparian area and there was no additional channel reconstruction. The Alumni Drive sites were natural channel design projects, and the Wolf Run site has many alterations.

As an example, Mr. Sena explained samples were collected at the upstream and downstream sections of the reach for the Alumni Drive site, near University Drive and Nicholasville Road. This was completed bi-weekly beginning in November 2021 to present day. The method involves collecting samples and testing for significant and consistent differences from upstream to downstream.

Mr. Sena spoke about the program's current study as to whether restoration/ reforestation influences stream health, by studying the following questions:

- Does stream-water quality change as a stream passes through a reforested area?
- Do macroinvertebrate communities reflect improved environmental conditions in reforested reaches compared to non-restored reaches?
- Do microbial and soil conditions reflect improved environmental conditions in reforested reaches compared to non-restored reaches?

Mr. Sena described the Water Quality sampling procedures and significant findings:

- Water samples taken from upstream and downstream across seven sites every two weeks
- Upstream: Control Group
- Downstream: Experimental Group
- Water samples analysed for several different aspects: NO₃-N, Conductivity, etc.

Mr. Sena explained the significant findings from the study to date and displayed the results table data.

- The nitrate concentration decreased significantly through the reforested reach, noting the decrease across multiple sites including Alumni East, Alumni West, Hickman Tributary, and Wolf Run
- Mean difference is the mean difference across all of the sampling pairs between the upstream and downstream samples
- P-value is the significance of the paired t-test between those upstream and downstream samples compared by date

	Alumni East		Alumni West		Hickman Tributary		Masterson		Ribbon		West Hickman		Wolf Run	
	Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value	Mean Diff	p-value
Cond	42.084	0.349	122.611	0.023	23.861	0.044	29.875	0.293	41.611	0.017	18.595	0.013	14.379	0.254
Cl	5.503	0.568	8.119	0.225	-3.708	0.028	10.281	0.085	4.893	0.028	1.024	0.456	0.576	0.803
SO4	3.944	0.142	11.714	0.082	4.412	0.019	0.853	0.413	-5.516	0.053	1.853	0.164	0.844	0.459
Mg	-0.123	0.524	0.311	0.123	0.131	0.001	-0.091	0.259	0.060	0.328	-0.020	0.618	0.138	0.503
Ca	-0.276	0.738	2.980	0.269	0.178	0.632	-0.560	0.302	0.767	0.017	0.043	0.870	0.686	0.207
K	-0.269	0.167	-0.044	0.926	0.126	0.097	0.354	0.007	-0.363	0.034	0.076	0.139	-0.116	0.022
Na	-0.175	0.057	0.115	0.260	-0.141	0.029	0.333	0.046	0.138	0.616	-0.007	0.897	-0.039	0.676
Alkalinity	19.969	0.006	14.706	0.019	30.404	0.005	-22.456	0.002	33.635	0.000	3.814	0.670	7.192	0.112
pH	-0.006	0.833	-0.247	0.000	0.086	0.000	-0.109	0.013	0.083	0.035	0.007	0.727	-0.004	0.935
NO3. N	0.176	0.000	0.509	0.001	0.259	0.000	-0.079	0.519	0.013	0.857	0.056	0.259	0.171	0.001
NH4. N	-0.001	0.331	-0.005	0.380	0.008	0.122	0.011	0.569	0.021	0.191	-0.005	0.275	0.000	1.000
TOC	1.096	0.132	0.217	0.713	1.475	0.098	-1.218	0.007	1.843	0.006	0.247	0.669	0.527	0.282
NO2. N	-0.187	0.495	0.032	0.140	-0.036	0.454	-0.091	0.245	0.032	0.346	0.032	0.137	0.016	0.548
Br	-0.039	0.866	-0.337	0.100	0.234	0.219	-0.287	0.092	-0.763	0.532	-0.245	0.070	0.059	0.789
Fl	-0.008	0.658	0.105	0.305	0.004	0.453	0.003	0.793	0.010	0.540	0.013	0.086	0.013	0.003

Mr. Mills discussed the macroinvertebrates sampling procedure as follows:

- Deployed leaf packs at all sub-sites
- Conduct data analysis: taxa diversity (Shannon diversity index), richness, evenness, and Pollution Tolerance Index (Stroud Water Research Center)
- Minor issues → weather left some bags dry or flash flooding would push the bags onto the banks

Mr. Mills identified the Macroinvertebrates Significant Findings:

- Diversity low overall: 0.0323 to 1.44
- Richness: 1 to 9
- Evenness: 0.124 to 0.961 → High evenness correlated with low diversity
- PTI: 1 to 13 (Poor to Fair)
- Site variability diluted a lot of the findings and voided any consistent patterns

The study consisted of distributing three leaf packs per sub-site per stream which remained for several weeks. After retrieval, the packs were cleaned and preserved for analysis and identification of the species. Mr. Mills discussed tolerance distribution and said there were some sensitive taxa found, but not frequently. Some preliminary correlations indicate that there is a correlation between the age of the site (how long has the restoration been there) versus average diversity and average pollution tolerance index score. As those numbers increase, the diversity and the pollution tolerance of the taxa found increase. Nitrate has the opposite effect. The more nitrate you have in a stream, the less diversity will be present.

Mr. Sena mentioned that to check for continued consistency in the results, they would like to do a more robust sampling next spring to repeat the analysis of a particular macroinvertebrate.

Mr. Mills described the soils sampling procedures which focused on how reforested riparian zones effect the soil found in the buffer zone versus the grass zones nearby. He noted the soils were tested for Phosphorous, Nitrate, Calcium, etc.:

- Soil samples collected at each sub-site
- One sample from the buffer and another from outside
- DNA extraction to compare microbial communities across samples
- Extraction, dilution

- Currently conducting PCR, sequencing soon
- Infiltration analysis using a double-ring infiltrometer

Mr. Mills briefly explained significant soil sampling findings and noted that zinc, which promotes chlorophyll, almost doubled. This is important to watch, to see if it continues to increase, because increased zinc at a certain concentration can begin to inhibit plant growth. Although it is important, too much can be negative and should be looked at in future samples.

Mr. Sena noted the variability across sites was pretty significant with the soils samples. There were not a lot of significant differences between the buffer and adjacent grass soils for the things that were being measured, which was surprising.

Mr. Sena concluded that there is a shift in water quality as streams are moving through the restored areas, which is a positive. He said that what still needs to be determined is whether that change is impacted by dilution. If additional water is being added to the stream through that reach and there is a dilution effect then this could be the reason the concentration is going down, or conversely if there is water being taken out of the stream, that may be why the concentrations are increasing through that reach. He said that the next step will be to deploy flow sensors at the sites to see if there is any shift being experienced in the stream flow through that reach as well. They will then use the stream flow and concentration data to compute loads to give a better idea of the actual nitrate uptake or addition through the reach. They will continue the analysis of microbial soil diversity between grass sites and buffer sites.

Questions and comments

Demetria Kimball Mehlhorn referred to the pollutant-tolerant macros and asked if the drainage area for these sites has been reviewed. She added that there may be more significant pollutant runoff potential upstream in some areas versus other areas. Mr. Sena mentioned they added reach length and restored buffer area in the most recent data pool, but not the drainage area, but he liked the idea for future studies.

Ken Cooke asked for a brief explanation of the Hickman Tributary soil findings. Mr. Sena and Mr. Mills explained the table shows the mean infiltration rate (milliliters/5min interval) for the areas and the mean difference between the buffer and grass, which were not statistically significant for this study. Mr. Cooke asked if these rates could be converted to gallons/hour or similar. Mr. Sena said they thought there would be increased infiltration in the buffer site but that was not the case.

Mr. Cooke inquired about total phosphorus and SRP being absent from the analysis. Mr. Sena noted that the Department of Forestry provides their services for free and they did not offer that testing.

Malissa McAlister asked besides tree planting what other BMP could be used to enhance the macroinvertebrate community. Mr. Cooke commented that the stream bed at the Alumni Drive site was reconstructed to improve the habitat, and using leaf packs tends to favor the shredders as opposed to the more predatory macroinvertebrates. He added that he uses leaf packs for larger bodies of water and lakes, but for flowing streams the traveling kick-net method and riffle sampling is used. Mr. Sena said they would add additional sampling methods in the spring. In the Reforest the Bluegrass sites, only tree planting was done; no stream channel work. Ms. Wilson added that Coldstream was an exception, however it was not part of this study.

Jack Wilson questioned if there was a census on the species of plants located at the sites to differentiate the effects of trees versus shrubs. Mr. Sena responded that all of the Reforest the Bluegrass sites were well-treed buffer areas. The Alumni Drive sites have young trees, tall grasses, and a shrub plant community. For all sites, the adjacent area to the buffer was mowed lawn. Mr. Wilson commented it would be interesting for those who do restoration projects to have data on the wide variety of plants and what impacts those have on the water quality and soil. Mr. Sena concurred and thinks this could be researched in the future.

Jason Unrine asked if they have looked at non-restored sites as a comparison. Mr. Sena said the comparison was upstream vs downstream, but that would be a good idea for the future. Mr. Sena concluded by saying that data is available from other monitoring work the City has done, and he is working with Lindsie Nicholas on how to utilize that data.

Utilizing Trees in Stormwater Basins to Increase Urban Tree Canopy

Heather Wilson, Division of Environmental Services provided a synopsis of Lexington's Urban Forest, the importance of trees, and how stormwater basins can help increase the urban canopy.

Ms. Wilson asked what the benefits of trees are for the community. Several audience members answered by saying trees provide cooler air, evapotranspiration, filter air, and provide shaded areas and wildlife habitat. Ms. Wilson said that research shows trees not only have a positive impact on the environment, but also have social well-being and human health benefit impacts on our day-to-day lives.

Ms. Wilson went into detail about human health factors. She stated people that who have tree-lined areas are more likely to walk outside rather than stay inside. Trees also work to strengthen community ties in the form of tree plantings and cleanup days. In addition, she noted that trees promote gathering in parks that bring families, friends, and neighbors together.

Ms. Wilson explained the economic benefits of trees such as:

- Homes landscaped with trees sell for 5% - 15% more than homes without trees
- Lower cost of utility bills
- Tree-lined streets & communities attract more businesses and people tend to shop longer ([2014.City-Trees-and-Consumer-Response.Bk Chapt.Wolf.pdf \(naturewithin.info\)](#); [The Urban Forest \(naturewithin.info\)](#))
- Shoppers are willing to pay a higher price point for goods in treed streetscapes ([BizTreesAll_JFor.pdf \(naturewithin.info\)](#))
- Employees are more productive in businesses where a canopy of trees exists

Ms. Wilson also detailed the environmental benefits of trees as shown:

- Remove pollutants from our air and water
- Reduce stormwater runoff
- Retain soil along streambanks
- Cool waterways
- Reduce the effects of heat islands
- Provide habitat
- Store and sequester carbon

Ms. Wilson touched on the basics of tree biology. The bark, which varies in depth from species to species, protects the living tissues inside the tree. The cambium lies just inside the bark and produces new cells, including the cells that make up the xylem and phloem. The Phloem transports sugars from the leaves down, and the xylem moves the water and nutrients up from the roots through the system of the tree. The heartwood acts as a carbohydrate storage and aids in the structure of the tree.

Ms. Wilson emphasized that the roots of a tree have to be anchored in the soil to balance the tree canopy as it grows and allows it to bend without snapping or falling over. Roots, if given the right space, will grow up to two times the canopy of the tree. Ms. Wilson said that feeder roots tend to be within the top 10 inches of soil. Mycorrhizae will attach to the roots to help expand the ability of the tree to access water.

Ms. Wilson then said that when working with trees one must be sure there is enough soil volume to anchor that tree and provide water and nutrients. Where possible, it is important not to cut within the dripline of the tree or disturb the surface around the tree.

Ms. Wilson said that trees are important in rainfall and stormwater runoff reduction because as the rain hits the top of the trees, the water first hits the leaves and then runs down the branches and trunk slowing the water flow until the water infiltrates into the ground. Trees act as the first line of defense to remove rain pollutants before the water infiltrates into the soil and enters waterways.

Ms. Wilson provided factors that can affect the tree's impact on runoff reduction including tree species, canopy spread, leaf surface area, stem surface area, surface saturation storage capacity, leaf on vs. leaf off, transpiration, rainfall intensity, rainfall duration, and time of year. Research suggests that tree canopy provides increased benefits with low intensity storm events.

Ms. Wilson suggested using i-Tree Design (<https://design.itreetools.org>), which is a tool that helps estimate individual tree benefits in terms of carbon dioxide, air pollution, stormwater impacts, and energy savings. She gave an example of an Overcup Oak Tree that can process 6,400 gallons of rainfall and help avoid 498 gallons of stormwater runoff every year.

Ms. Wilson touched on the goals of the Lexington Urban Tree Canopy Analysis:

- To provide sound data to enable Lexington to track canopy gains & losses over time; facilitate long-range planning; develop canopy goals; analyze current land cover; develop sound management plans, and promote the benefits of trees
- To guide the development of a Strategic Tree Planting Plan
- To help garner support for increased Urban Forestry Activities
- To connect individuals & groups working within Environmental disciplines

Ms. Wilson provided a brief description of the September 2015 Comprehensive Urban Tree Canopy Analysis Report:

- 2012 – Davey Resource Group Study
- 2015 – Analysis Complete & Report Cards Produced
- 25% tree canopy coverage noted within the Urban Service Boundary
- Canopy findings assessment: Council Districts, Watersheds, Sewersheds, HOA Neighborhoods

Ms. Wilson noted that in 2022 Planet Geo had completed their updated analysis, which determined Lexington tree canopy was at 23% with a 5% increase. She said that Planet Geo had refined the previous data, incorporated the younger trees that were not used as well as used other technology advancements. Planet Geo analysis can be used to determine the location where the tree should be planted.

Ms. Wilson said that in reviewing the storm basins and the Urban Tree Canopy coverage, there are 1,233 storm basins throughout Lexington and approximately 97 of those basins have the potential to be retrofitted with trees, potentially creating 122 acres for tree plantings. She presented a map to show how the trees are distributed throughout Lexington and noted the high concentration of storm basins and the areas of town that have lower tree canopy coverage. She also noted the different watersheds that have lower tree canopy coverage.

Ms. Wilson explained that one of the challenges with retrofitting basins is many of these basins are privately owned. Retrofits allows for opportunities to connect with property owners and encourage them to do plantings on their property and engage local stewardship groups throughout the community to help with plantings. She noted LFUCG has a tree nursery for plantings on public property. The Tree Ad Hoc Committee could help connect private property owners with local non-profits to look into funding opportunities such as the Stormwater Quality Projects Incentive Grant Program.

Ms. Wilson discussed Reforest the Bluegrass and noted that it was started as a way to help to recover our waterways, and reduce stormwater runoff and reduce pollutants. The program is funded through donations to help mitigate streambanks that had been denuded, to slow the runoff of pollutants into the streams and to help manage stormwater throughout Lexington. She said that the first tree planting of Reforest the Bluegrass was in 1999 when 10,000 tree seedlings were planted. Now there are between 5,000 and 7,000 tree seedlings planted each year by volunteers.

Ms. Wilson said that tree planting is a good way to use open lands and educate the public regarding water and trees. She also said it would help with water quality / quantity as well as the environmental problems, such as pollutants in streams. She believes that research on planted basins would broaden the data on infiltration rates. She stated that going forward, there are lots of opportunities for improving our tree canopy and improving stormwater quality / quantity in tandem.

Questions and comments

Scott Smith said that the Ashland Park area has a lot of trees that are well over 100 years old. It seems that year after year more trees are being removed, and he asked if there is an educational program the Neighborhood Associations could provide to homeowners showing the benefits of keeping mature trees instead of removing those trees. Ms. Wilson advised there is no established program, but the Neighborhood Association can request a staff member to attend their meeting. She said that there are many challenges when it comes to trees and it can become controversial. A person either hates, loves, or does not understand trees. She went on to say that the benefits of a mature tree outweigh the issues, and understanding trees is through education. Mr. Smith commented that insurance companies are encouraging some homeowners to remove the trees closer to their houses. Ms. Wilson responded that education would be helpful in that situation.

Gabriel Hensley, Division of Water Quality, said that from a maintenance perspective the idea of having trees in a basin is controversial. There are maintenance requirements that have to be met and the design of the basin requires water to flow in and out of that basin. When there are leaves and limbs in a basin causing issues, it seems counter-intuitive to plant trees causing more maintenance issues to that basin. He asked if the maintenance of the basins has been considered and if there is any data

on this issue. Ms. Wilson said that maintenance has been considered and it was discussed. For Environmental Services, it is one of the hardest things to figure out. This retrofit concept is in its early stages and maintenance will be a priority moving forward with planning and design.

Ken Cooke remarked that the Wellington Park basin was reforested and eventually became a retention basin. He said that around 2004, Pine trees were planted at the Horseman Lane basin as well as at the basin behind Good Foods Co-op. He believes that those areas could be looked at for maintenance issues and the cost impact. He then said that engineers would need to answer how this affects the discharge rates, flow rates, and the time of concentration impacts in terms of how these basins are seeded in the larger watershed.

Charlie Martin commented that access into and out of retrofitted basins will need to play a role in site selection when thinking about basin maintenance. He said that the basins mentioned by Mr. Cooke were easy ones to reforest. However, basins like Burkewood are a challenge to access for removing debris that comes as a byproduct of our urban presence. Ms. Wilson replied that is why some basins are probably not eligible for replanting.

Ms. Wilson commented on the missing calculation for the amount of water that is being removed through the existing tree absorption when designing detention basins. She asked if design calculations incorporated how much water is being removed from the system by the existing trees (pre-construction). Mr. Martin and Mr. Lubeck responded in the negative. Greg Lubeck, Division of Water Quality, commented it is based on volume, and infiltration is incidental and focuses on keeping the volumes and flow rates, pre and post-construction, the same. Mr. Martin added that the calculations are based on peak flow because the peak flow impacts the uptake ability of those trees.

Ms. Wilson said that since the initial calculations are not separating out tree absorption, she asked if there is any consideration for this when keeping the pre and post-volume and flow rates the same. Mr. Cooke responded that a stormwater basin is designed based on a larger storm events for flood control. The contribution from trees and vegetation in removing water from the system is small when dealing with such large volumes of water from these flood events.

Mr. Cooke commented that there is a whole class of smaller storm events that do not target flood control goals and are not part of the analysis. Mr. Lubeck replied that is the water quantity part. He said that for new development the water quality volume and runoff reduction volume come into play for the 90th percentile (smaller, more frequent) storm events. Water quality calculations capture some of this when looking at where the water is being discharged and if the area is changing from forest to grass, etc.

Tom Martin, Division of Planning, said that areas that seem to be heavily wooded are areas that have grown up in the last 15 years. He indicated that as areas are developed, the city is doing a better job of protecting our trees. Ms. Wilson agreed.

Ms. Kimball Mehlhorn commented that as far as the maintenance is concerned the staff looks at what not to plant in an area. For example, it would not be beneficial to use Willow trees, trees that have acorns, or Coffee trees because of the pods. It would be beneficial to look at approved tree species that are lower maintenance in a detention area so there is less clogging. Ms. Wilson agreed that basin maintenance will have to be a key consideration moving forward.

Jennifer Carey, Environmental Services, said that a basin can handle leaves, but keeping the concrete channel free of leaves and clippings is vital for keeping the basin functioning. The times the staff has seen real maintenance issues is from property owners / outside influences intentionally dumping grass clippings in a detention basin. It is the extra load that is causing the maintenance issue, not just what is in the basin itself. Mr. Martin also noted that street grit is also a heavy contributor to basin maintenance needs, and there are some basins where that grit is removed regularly.

Expired Watershed At-Large Seats (Cane Run & Kentucky River expire 9/6/2022)

Lindsie Nicholas explained that the Watershed At-Large seats for the Cane Run and Kentucky River have expired. She noted that Eileen Burk (Kentucky River) and Jim Conner (Cane Run) are willing to continue serving.

Ken Cooke moved to accept the nominations by acclamation. Jennifer Carey seconded the motion. The motion carried, and Mr. Conner and Ms. Burk will occupy the seats for three more years.

Potential Topics for Next Meeting, December 2, 2022

Ms. Nicholas hopes to have an update on the West Hickman Watershed Management Plan in the near future. She noted in March there will be a presentation on UK's PFAS Sampling Study on March 3, 2023.

Ms. Nicholas opened the floor for potential topics at the December 2nd meeting.

Scott Smith suggested a presentation from the staff on the Infill & Redevelopment criteria concerning residential properties.

Mr. Cooke said that there is a threshold on the size of the lot and how it is reviewed when an application is submitted. He explained that if a quarter acre lot was repaved, then over time there will be other quarter acre lots repaved, and this will cause an overall impact on the area.

Mr. Smith said that he would like to know the requirements for Infill and Redevelopment areas and asked if those requirements work. Mr. Cooke agreed.

Eileen Burk requested additional information regarding the Infill / Infiltration Program and how it has evolved.

Amy Sohner proposed discussing the Empower Lexington Plan once finished.

Announcements

1. Demetria Kimball Mehlhorn elected to serve as the Secretary-Treasurer of SESWA, Congratulations
2. Rain Garden/ Riparian Buffer Mini Grants, Bluegrass Greensource - September 13 (ZOOM)
3. Watershed-Focused Monitoring Program Volunteer Sampler Training – Sept 16 at 9 a.m.
4. Art by Nature – Now through Sept 24th | Loudoun House
5. Nature Hop – Sept 17 and 18
6. Friends of Wolf Run Greenways Tour – September 28th, 1:00 p.m. to 4:00 p.m.
7. Tree Week 2022 – Oct 8-16 (Urban Forest Initiative)
8. Gobble Grease Toss – Nov 25
9. Next Meeting – Dec 2
10. Workshop with the Development and Construction Industry, Fayette County Extension Office - December 16

Adjournment

The meeting concluded at 10:53 a.m.