

Euclid Creek Riparian Tree and Shrub Planting Program

LEPF SG 484-2014

TECHNICAL REPORT

Claire Posius
Euclid Creek Watershed Coordinator
Cuyahoga Soil & Water Conservation District

Introduction

The Euclid Creek Watershed encompasses 24 square miles in northeastern Cuyahoga County and a part of Lake County. It covers portions of 11 communities, 10 of which are Cuyahoga County communities. Euclid Creek is a direct headwater tributary to Lake Erie and a part of the Cuyahoga Area of Concern. The watershed has largely been developed over the past 150 years and although nearly 85% developed, the watershed continues to be threatened by development. Due to the urban nature of the watershed it is characterized by the following impairments: organic enrichment; nutrients; flow alteration; and, habitat degradation. Partners in the watershed including the Cuyahoga Soil & Water Conservation District (Cuyahoga SWCD-staffs the Euclid Creek Watershed Coordinator position), Euclid Creek Watershed Council (ECWC-9 municipalities that govern the watershed program) and Friends of Euclid Creek (FOEC-the citizens non-profit group) are actively implementing the Euclid Creek Watershed Action Plan, following recommendations and actions to preserve, restore and manage the creek for future generations.

A major priority in the Euclid Creek Watershed Action Plan, endorsed by Ohio Department of Natural Resources (ODNR) and Ohio Environmental Protection Agency (OEPA) in 2006 and 2005, respectively, is to protect and restore functionality of the riparian corridors along the 43 miles of stream in the Euclid Creek in order to maintain water quality in the stream, increase habitat, stabilize stream banks and decrease stream velocity and sediment production. 51% of the Euclid Creek Watershed is made up of residential property, making these property owners pivotal to educating about the benefits of riparian buffers. Roughly 7 of the 30 miles of riparian area in the Euclid Creek Watershed is protected parkland owned by the Cleveland Metroparks and maintains adequate riparian buffer. The remaining 23 miles is primarily headwater tributaries owned by residential and commercial private property owners who will be the primary target audience for this tree and shrub planting program.

The goal of the Euclid Creek Riparian Tree and Shrub Planting Program is to restore stream water quality and function in urban and suburban areas through the establishment of vegetated buffers on riparian properties within the watershed.

Objectives

The two program objectives, as identified in the LEPF grant application, are:

1. Directly educate all streamside private property owners in the Euclid Creek Watershed, roughly 1,300 riparian landowners, about the importance of maintaining and restoring functioning, forested riparian corridors.
2. Provide tree and shrub seedlings to at least 100 riparian landowners, sufficient to reforest at least 2 miles of riparian corridor within the Euclid Creek Watershed.

Methods

Program activities are divided into the following categories: *Landowner Outreach/Promotion; Seedling Selection & Distribution; and Post-Planting Audit/Inspections.*

Landowner Outreach & Program Promotion

A desktop GIS analysis was performed by Cuyahoga SWCD in order to identify all riparian landowners in the Cuyahoga and Lake County portions of the watershed. This analysis generated 1,418 addresses of streamside property owners. A brochure (*Attachment A*) describing how to enroll in the program and explaining the importance and benefits of establishing and maintaining forested riparian corridors was created and mailed to all 1,418 addresses in January 2015.

In addition to basic participant identification and property location information, the enrollment form contained in the brochure asked for details about the length of stream on the resident's property and if the resident owned one or both sides of the land adjacent to the stream. Upon receipt of the enrollment form, this information was entered into a participant management database.

A program website was created to provide program information and updates on a timely basis. The web address is: <http://www.euclidcreekwatershed.org/euclid-creek/programs/euclid-creek-streamside-tree-and-shrub-planting-program>.

To further promote the program, a press release (*Attachment B*) was sent to media outlets whose coverage area includes the Euclid Creek Watershed. Four of the watershed communities with the most riparian property owners promoted the program; the Cities of Euclid, Lyndhurst, Richmond Heights and South (*Attachment B*).

Seedling Selection & Distribution

The criteria taken into consideration in the selection of tree and shrub seedlings were:

- suitability for planting in riparian areas;
- suitability to general soil conditions in the watershed;
- native to Northeast Ohio; and,
- availability for purchase.

Based on these criteria, the species selected were: American Sycamore, Swamp White Oak, Pin Oak, Serviceberry, Eastern Ninebark, Silky Dogwood and Red-osier Dogwood.

While each planting site is unique, a generalized buffer was created for planning purposes. This generalized buffer extends 25 feet from the water's edge and utilizes 10'x10' plant spacing. 25 feet was selected as the buffer width because it is the minimum riparian setback width recommended in the Northeast Ohio Storm Water Task Force Model Riparian Setback Ordinance. This spacing results in 35, 3-gallon trees and 383 seedlings per acre. *Table 1* illustrates the number of seedlings distributed to program participants based upon the length of stream owned and whether or not both sides of the stream were owned.

Table 1. Number of Seedlings per Length of Stream

Length of Stream Owned	Number of Sides Owned	Number of 3-gallon Trees	Number of Seedlings
50 feet	1	1	11
50 feet	2	2	22
100 feet	1	2	22
100 feet	2	4	44
150 feet	1	3	33
150 feet	2	6	66
200 feet	1	4	44
200 feet	2	8	88

Program funding, through the Lake Erie Protection Fund, was available to purchase 429 3-gallon trees and 4,725 seedlings, which is sufficient to plant 12.68 acres, or which equates to 4.33 miles of single-side riparian buffer (2.17 miles of double-side riparian buffer).

Originally, we had planned on buying all bare-root seedlings, but after consulting with partners with expertise in riparian restoration, we decided to purchase a mixture of 3-gallon trees and seedlings as the mortality rate of seedlings is much higher than with the larger trees, so we wanted to have some hardier plant stock available. The 429 3-gallon trees were purchased from Riverside Native Tree in Ohio (Sycamore, Swamp White Oak and Pin Oak) and the seedlings (Sycamore, Swamp White Oak, Serviceberry, Eastern Ninebark, Silky Dogwood and Red-osier Dogwood) were purchased from Engel’s Nursery in Michigan. Engel’s Nursery was able to provide the desired seedlings at a lower cost than the nurseries closer to home in Ohio and Pennsylvania, increasing the number of seedlings purchased for the program. Lastly, instead of purchasing tree tubes, we purchased wire caging, wood grade stakes and zip ties to provide with each 3-gallon tree for protection from deer. This tree protection method kept the cost down and allowed us to purchase protection for the 429 trees. While we did not have the budget to protect the 4,725 seedlings, we provided participants with instruction on how to protect the seedlings.

Notification cards (*Attachment C*) were mailed to program participants in March 2015, indicating the date, time and location of the seedling distribution, the types of trees and seedlings, and the number of trees and seedlings to be received. Plants were distributed to streamside participants on April 30, 2015 from 6:00 to 8:00pm and on May 2, 2015 from 9:00 to 11:30am at the City of Lyndhurst Service Garage, a central location in the watershed. After these two distributions, 34 enrollees of the 109 had not picked up their plants, so we offered a third and final distribution on May 5, 2015 from 4:00 to 6:00pm to allow the remaining enrollees a final chance to pick up their plants, otherwise 31% of the plant stock would have been unclaimed. Overall, 83% of enrollees picked up their plants. Roughly 16% of plant stock remaining was planted at public sites in the watershed adjacent to streams, and ~1% was given to watershed groups who could plant the trees in a timely manner on a Lake Erie direct tributary (approved by Rian Sallee before distributing to outside groups).

The two, primary distribution events featured a presentation by a certified arborist on proper planting, maintenance and deer protection recommendations for both the 3-gallon trees and the bare root seedlings for participants to attend and ask further questions.

Volunteers from the Friends of Euclid Creek and the Euclid Creek Watershed Council assisted Cuyahoga SWCD staff with the distribution. Volunteers helped cut wire caging to size for deer protection and sorted seedlings into diverse groupings so each participant would receive a mixture of trees and shrubs. Finally, participants were provided with the following materials:

- planting guidance brochure (*Attachment D*),
- Woods for Waters – a guide to planting riparian buffers for healthy streams (*Attachment E*),
- Euclid Creek Watershed Newsletter (*Attachment E*), and,
- Stream erosion fact sheets (*Attachment E*)

Between the presentation/demonstrations at the distribution events, having professionals at the distributions available to answer questions, and the take-home guidance document handed out to participants, we received no follow-up calls from landowners with questions or concerns.

Post-Planting Audit / Inspections

One way to gauge success of a plant distribution program is to conduct an audit, a site inspection, for a certain percentage of enrollees after the plant distribution to see if the trees and shrubs were planted. We planned to inspect 15% or 14 sites after participants received their plants, but we inspected 40% or 36 sites 3 ½ months after the plant distribution. Each site visit and the access required was approved by the property owner ahead of time and consisted of walking the streamside area of the property to see if the trees and seedlings were planted, if they were planted in the correct streamside location, and to see survival rate. For the purposes of this analysis, we gauged success with a simple yes or no based on if we found the 3-gallon trees planted near the streamside. The seedlings were difficult to find unless they were flagged or unless the property owner was present to point out the location of the seedlings. Of the 36 sites inspected, 32 or 89% were planted and in the correct location, and 4 or 11% of the sites were not planted at all. An inspection report with photos is attached (*Attachment F*).

The inspections showed several trends. The 3-gallon trees fared much better than the seedlings. One species of tree, the Sycamore, had a higher mortality rate than the Pink Oak and Swamp White Oak, which was of concern to the nursery provider before delivery. A few participants were nervous about planting the seedlings in such a young and vulnerable state, so a few people planted the seedlings in containers to help them get established and then they were going to plant the seedlings either this Fall or in the upcoming Spring or Fall of 2016. Generally, people planted within 10' of the stream instead of spreading plants out over the 25' buffer as recommended.

Timeline

The project timeline outlined in the grant was followed except for the mailing of the program brochure to streamside property owners. The program brochures were planned to be mailed in November/December, but we held off on mailing the brochures during the busy holidays and mailed them out in January instead.

Results

All 1,418 identified riparian landowners in the Cuyahoga and Lake County portions of the Euclid Creek Watershed were mailed the brochure explaining the importance of riparian buffers and advertising the Euclid Creek Riparian Tree and Shrub Planting Program. Of those, 109 people enrolled in the program, which corresponds to a 7.2% response rate. Ultimately, 90 enrollees picked up their plants and collectively own 4.33 miles of stream, totaling 12.68 acres of riparian corridor (at 25' buffer width).

Table 2 summarizes participants by community.

The funding was sufficient to purchase seedlings for all 109 participants who enrolled (429, 3-gallon trees and 4,725 seedlings). Those 109 participants were notified via postcard with the distribution information. Of the 109 scheduled to receive seedlings, 90, or 83%, picked up their seedlings at either the April 30 distribution, the May 2 distribution, or the add-on May 5 distribution. A total of 416, 3-gallon trees and 4,500 seedlings were distributed to participants or to partners in the watershed who had not enrolled in the program but were able to plant remaining trees/shrubs in a riparian area. Those receiving seedlings planted a total of 12.68 acres, or 2.17 miles stream (for a total of 4.33 miles of 25-foot wide riparian corridor), in the program.

Of the remaining 13, 3-gallon trees and 225 seedlings, all were given to watershed groups directly adjacent to Euclid Creek and all direct tributaries to Lake Erie (Nine Mile, Doan Brook, and Tinkers Creek) to plant.

Post-planting inspections were conducted 3 ½ months after the distribution events. 36 sites, or 40% of participants’ properties were inspected to see if the plants were planted, to ensure they were planted along the streamside and to see how many plants survived. Of the 36 sites inspected, 32 or 89% were planted along a streamside and only 4 or 11% were not planted.

Table 2. Participation and Inspections by Community

City	# participants	# brochures sent	response rate	# inspected
Beachwood	0	39	0.00%	1
Cleveland	1	9	11.11%	0
Euclid	6	64	9.37%	2
Highland Heights	11	206	5.34%	1
Lyndhurst	17	194	8.76%	4
Mayfield Heights	0	0	0.00%	0
Mayfield Village	0	6	0.00%	0
Pepper Pike	0	28	0.00%	0
Richmond Heights	23	453	5.08%	4
South Euclid	34	197	17.26%	22
Willoughby Hills	17	222	7.66%	2
Total:	109	1,418	7.2%	36
County				
	# Participants	# brochures sent	response rate	
Cuyahoga	86	1196	7.2%	
Lake	17	222	7.6%	
Total Linear Feet of Stream - enrolled:		26,600	in miles =	5.18
Total Linear Feet of Stream - enrolled and picked up:		22,100	In miles =	4.33
Total Acres of Riparian Buffer – enrolled and picked up:		12.68		

Euclid Creek consists of roughly 30 miles of aboveground stream, of which ~7 miles is protected parkland with adequate riparian buffer, therefore this program helped restore 9.4% of Euclid Creek's riparian area watershed-wide.

The trees installed through this grant were run through the i-Tree program that provides a simple estimation of the benefits provided by trees. For this \$13,700 grant-funded project, estimating a 20% survival rate for the seedlings and an 80% survival rate for the 3-gallon trees, over 1 million gallons of stormwater would be captured by the trees over 10 years of growth with an ecosystem services benefit of \$11,836. At 20 years, the benefit of the trees would be in capturing over 4.5 million gallons of stormwater with an ecosystem services benefit of \$49,930 – quite the return on this grant's investment.

Discussion/Lessons Learned

Objective 1: Directly educate all streamside private property owners in the Euclid Creek Watershed, roughly 1,300 riparian landowners, about the importance of maintaining and restoring functioning, forested riparian corridors.

This objective was achieved through the mailing of the Euclid Creek Riparian Tree and Shrub Planting Program brochure to all 1,418 riparian property owners in the project area (Cuyahoga and Lake portions of the watershed), as well as the publication of articles about the program in several local newspapers.

It cannot be known how many mailings were either not delivered or not read for various reasons. However, it is highly likely that nearly all the brochures arrived at the appropriate addresses.

Objective 2: Provide tree and shrub seedlings to at least 100 riparian landowners, sufficient to reforest at least 2 miles of riparian corridor within the Euclid Creek Watershed.

This objective was nearly achieved through the delivery of seedlings to 90 riparian landowners in the Euclid Creek Watershed. Combined, they own 4.33 miles of stream, and had enrolled 5.18 miles (15.26 acres) of 25 foot-wide riparian corridor in the program.

The post planting inspections results were encouraging as 89% of the sites inspected planted their plants successfully. We will follow up with those same properties inspected next year to see how many of the plants survived.

While both objectives were closely met, many opportunities exist to improve programmatic effectiveness.

There is no built-in mechanism to monitor direct water quality or stream stability improvements. This prevents the evaluation of these quantitative environmental outcomes of the project.

The largest issue with the project found during the site inspections was the survivability of the seedlings. Unless the property owner was at the site visit to report that the seedlings were in fact planted, it was difficult to find the seedlings in established riparian areas, and few property owners flagged them as recommended. And of the sites where we knew the seedlings were planted, few remained due to a large spring storm that happened about a week after the distribution and/or due to deer browse. The storm event wiped out or damaged a lot of seedlings and a few of the 3-gallon trees. Deer browsing seemed to impact the 3 gallon trees much less due to the wire caging protecting the trees.

After talking to several watershed groups in the area, and knowing there are still 1,300 additional property owners who could take advantage of a future program, we would structure the program differently. Instead of hoping residents plant their plants and site them correctly, we could hire a landscape company to install the trees correctly with deer protection. Or another option is to use volunteers to plant the trees, as many property owners in the watershed are too busy or are seniors who had to hire landscapers to install the trees. Also, while seedlings have their place in large restoration projects, we would focus on providing all 3-gallon or larger trees to riparian property owners.

While it would have been ideal to have a larger budget to purchase tree tubes, it was cost effective and a great stewardship effort having volunteers cut the wire caging tree protection fencing. Also, for a future program, a more targeted program could be implemented to provide bank stabilization information to property owners on steep slopes, as a large percentage of properties on the East Branch of Euclid Creek are on very steep ravines with slippage prone soils and/or bedrock underneath.

Another program that could be successful for a future grant is targeting developments on the stream and working with Homeowners Associations (HOA) to install trees. Working with the Cutter's Creek HOA was a highlight of this program and will have great benefits on the 2,000 linear feet of stream planted and resulted in good discussions about other stream stewardship actions the HOA could implement.

Overall, participants had a positive reaction to the program. Several people wanted to plant trees on land not near a stream in the watershed, which could be yet another future grant program. We will survey and keep in touch with the participants in the program to monitor success into the future, which will be updated on the program website.

Remaining Budget Item Expenditure

At completion of the grant, roughly \$1,000 remained unspent from the budget. After discussing options with the grant manager, the remaining funds went toward purchasing additional tree protection for future riparian plantings in keeping with the original budget category and grant intent. In 2016, we are looking for corporate sponsors with watershed riparian area to extend this program's benefits. The sponsor would purchase the trees needed for the tree protection to be installed along a riparian area in the Euclid Creek.

This project was funded through the Lake Erie Protection Fund. The LEPF is supported by tax-deductible donation and voluntary contributions of Ohioans who purchase a Lake Erie license plate featuring the Marblehead lighthouse or the Lake Erie life preserver. For more information about the grant go to: www.lakeerie.ohio.gov.

