



Stormwater Committee

Stream Restoration - From City to Pasture to Suburbs
Wednesday, May 12, 2021 - 12:00pm - 1:00pm



Susan Harris, Advisor
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Brian Winslow, Watershed Conservation Director
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Become a member of PWEA ... visit www.pwea.org and click on the Membership tab.

PWEA Stormwater Committee Contacts

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PWEA Mission Statement

Enhance the knowledge and abilities of Pennsylvania's water quality professionals, promote sound sustainable water policies, and promote public awareness of the need to protect water resources.

Value of Membership

The Association's membership is comprised of approximately 1,800 professionals involved with water quality in Pennsylvania. PWEA is a Member Association of the Water Environment Federation (WEF), which is a not-for-profit association that provides technical education and training for thousands of water quality professionals. PWEA and WEF members have proudly protected public health, served their local communities, and supported clean water since 1928.

PennTec 2021 • June 20-23, 2021

Kalahari Resort & Convention Center, Pocono Manor, PA

Red Clay Creek Restoration at Anson B. Nixon Park

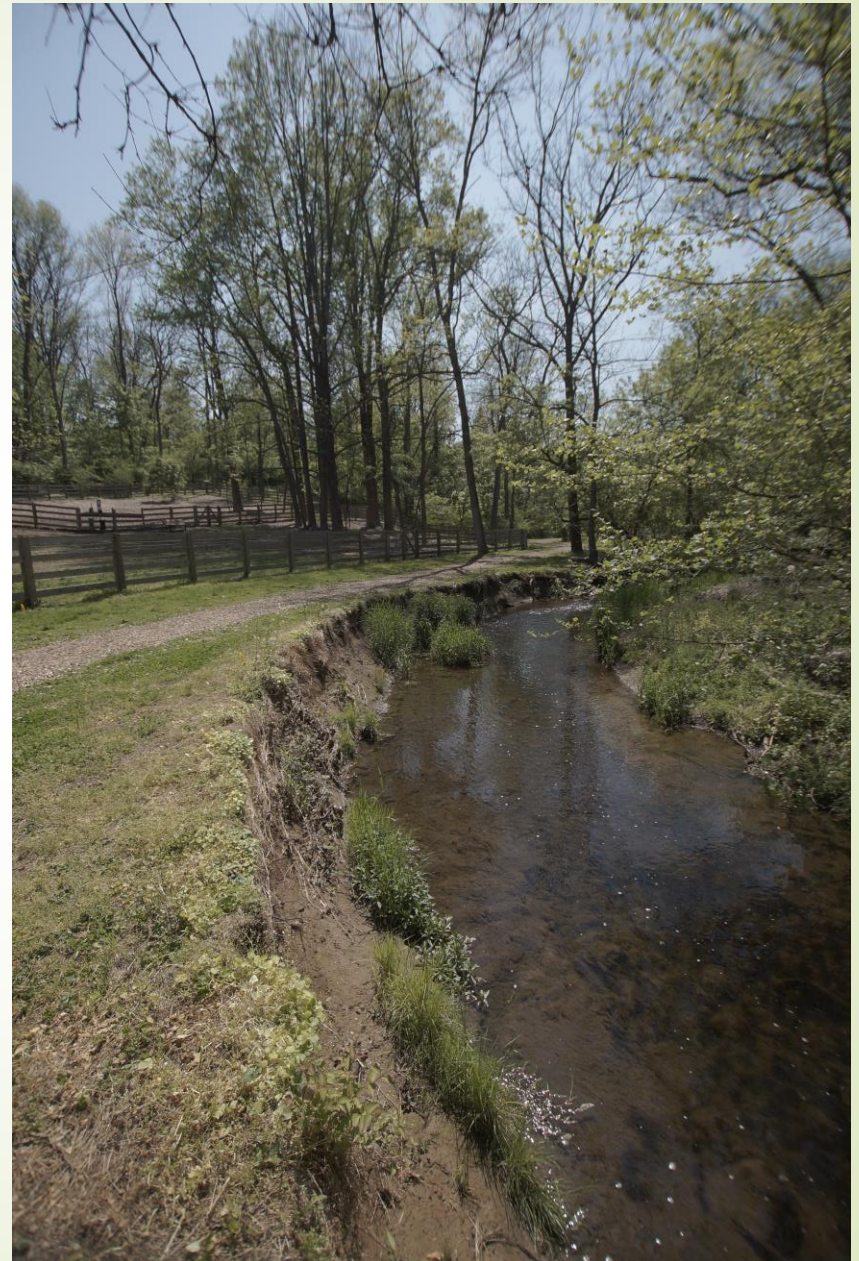


What is Stream Restoration?

- Targets impaired streams with:
 - Active bank erosion
 - Disconnected flood plain
 - Lack of riparian buffer
- Uses natural stream fluvial geomorphology
- Aims to restore stream to a stable channel



- **Benefits of stream restoration:**
 - Stabilizes eroded stream banks
 - Reduces sediment, phosphorous and nitrogen pollution
 - Helps municipalities meet MS4 Pollution Reduction Plans
 - Improves fish and wildlife habitat
 - Provides aesthetic impact
 - Coordinated with landowner land uses and goals



What Methods are used in Stream Restoration?

- Typical practices:
 - Grading stream banks to 4:1 slope
 - Flood plain reconnection
 - In-stream structures, using wood and rock
 - Re-direct flow to center of channel
 - Manage stream bed grade if needed
 - Create pools for habitat
 - Protect eroding banks where there is infrastructure
 - Riparian Buffer enhancement
 - Erosion blanket and native meadow seeding
 - Tree planting buffer 35 ft min.
 - Shrub/live stake planting



Stream Restoration is NOT

- **NOT THESE ACTIVITIES:**

- Rip-Rap channels
- Stream channel straightening
- Heavy armoring of stream banks
- Gabion Baskets



Pumping to work in dry stream



Grading stream banks to 4:1 slope



Newly graded banks with erosion blanket



Native grass and wildflower seeding



Root Wads used to reduce erosion



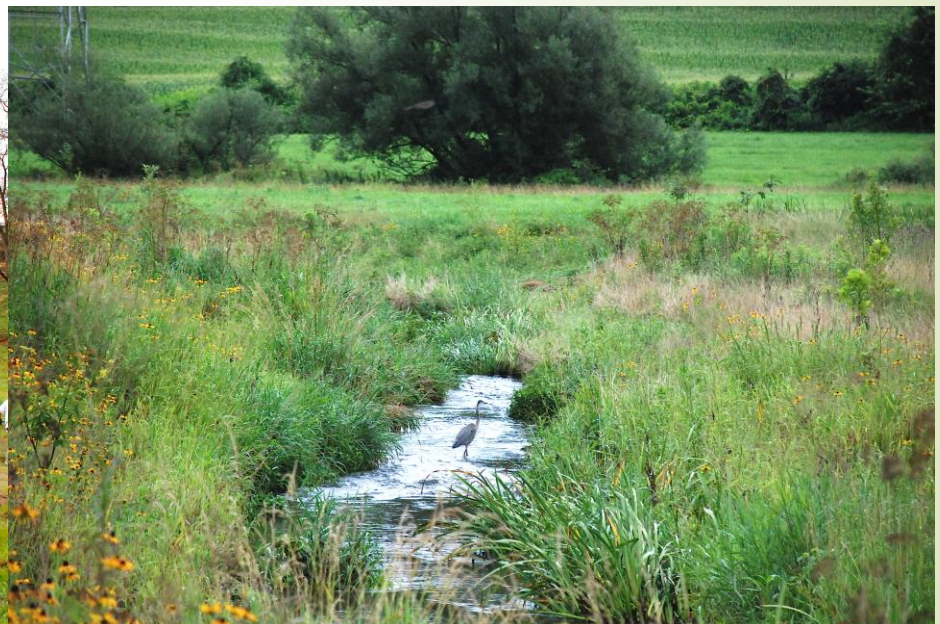
Rock and log vanes



Volunteer buffer tree planting



Vegetated stream restoration project



Typical Stream Restoration Timeline – 3 years

- Project site identification and landowner agreements
- Fund raising for design phase
- Design and permitting phase; 6-9 months
- Fund raising for construction phase
- Project bidding (often at PA Prevailing Wage)
- Construction Phase; 2- 3 months
- Annual inspection and maintenance; 5 years, 20 year landowner agreement





Upper East Branch Red Clay Creek Watershed Assessment Report

East Marlborough Township and Kennett Township, Chester County
Red Clay Watershed, Pennsylvania

October 2010



Prepared for:
Red Clay Valley Association
1760 Unionville-Wawaset Road
West Chester, PA 19382
(610) 793-1090

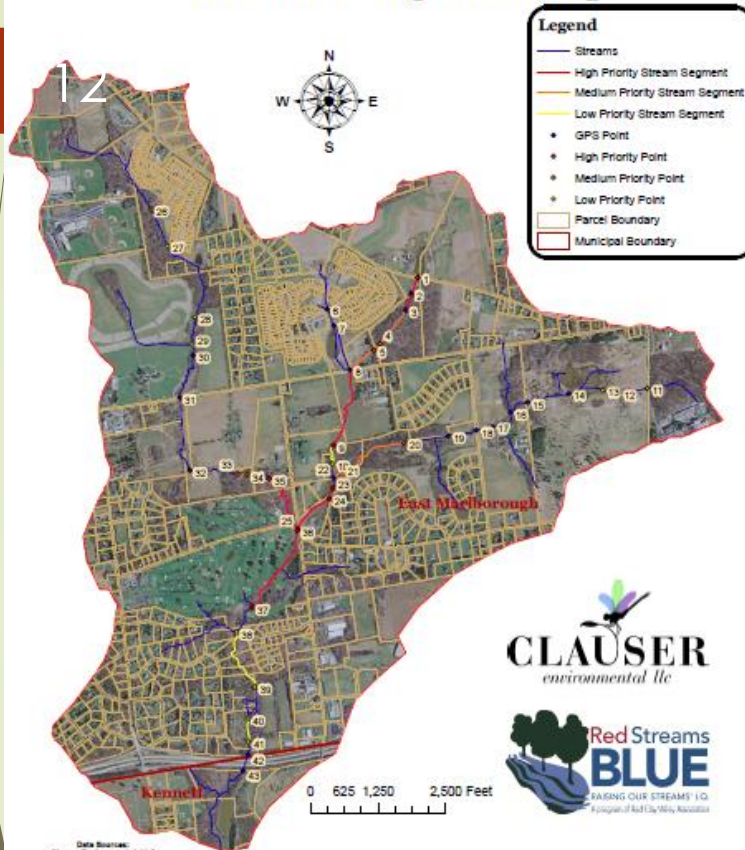


Prepared by:
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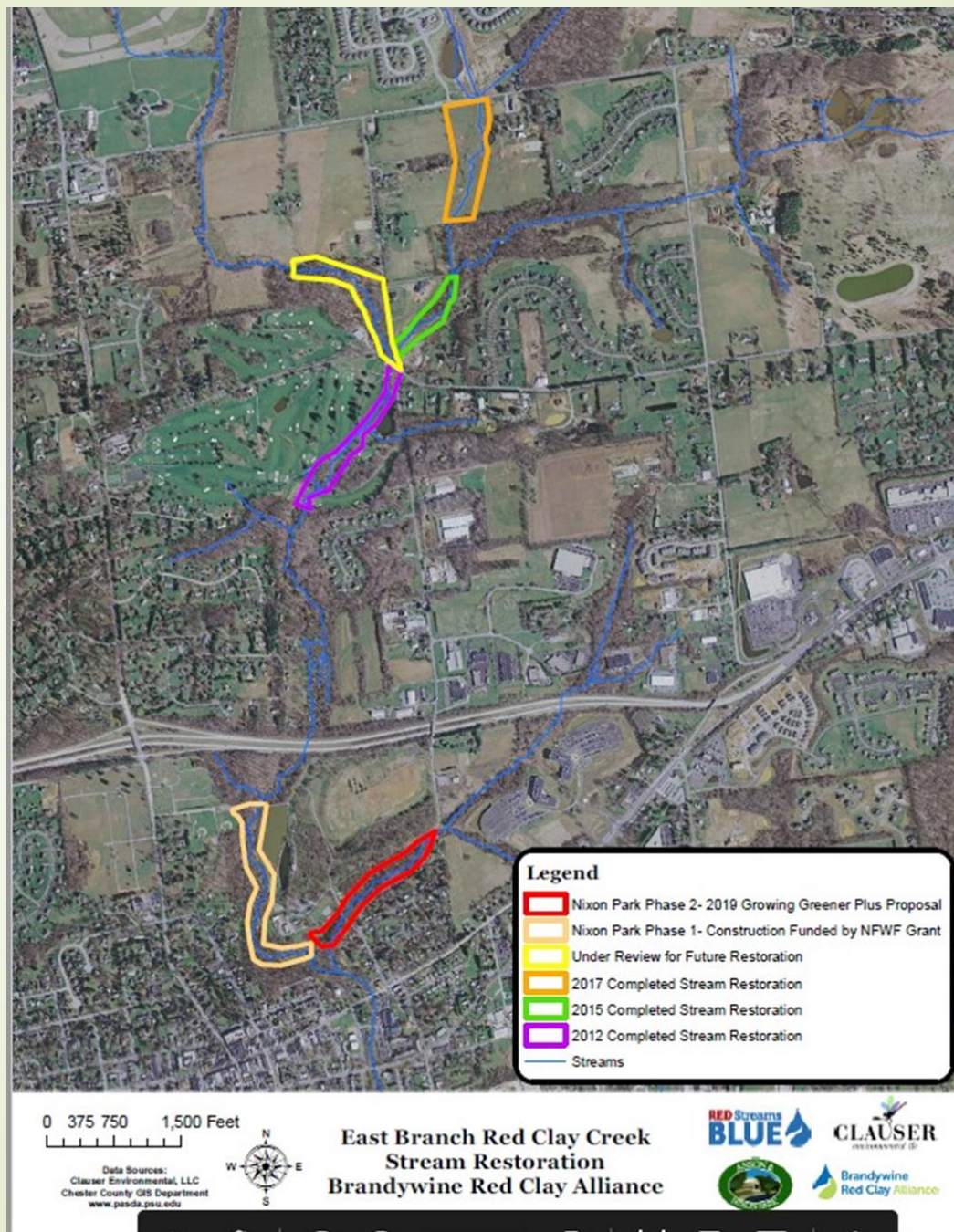
Upper East Branch Red Clay Creek Field Investigation Map



Date: 8/20/2016
Clauser Environmental, LLC
Chesler County GIS Department
www.geospatial.com

GPS Point Descriptions and Action Items

Point #	Description	Action Item	Key Partners	Red-Blue Priority
1	The mainstem of the Upper East Branch Red Clay Creek begins just upstream of this point at a large on-line dam. Downstream of this point, the streambanks are 3 to 4 feet high and eroded/healed over with meadow and some trees on both sides.	Streambank stabilization, riparian buffer enhancements, tree plantings on west side of stream	Landowner, Tree Vitalize, Conservation District	High Priority
2	Underdrains discharge to this section of stream from the west.	N/A	N/A	N/A
3	There is riparian buffer on both sides of the stream downstream of this point, streambanks are eroded in some areas 3-5 feet high.	N/A	N/A	N/A
4	An unnamed tributary discharges to the stream from the east in this location. The streambanks in the woodlands upstream and downstream of this point are eroded and about 3 to 5 feet high.	Streambank stabilization	Landowner, Conservation District	Medium Priority
5	Upstream of this point, the streambanks are eroded throughout a forested area. Downstream of this point, the riparian zone is mowed to the top of both streambanks to the SR-926 bridge.	Streambank stabilization upstream, riparian buffer enhancement downstream	Landowner, Tree Vitalize	Medium Priority
6	A bridge crosses over a wetland area on an unnamed tributary at this point. There are several stormwater basins that discharge to this area.	N/A	N/A	N/A
7	An abandoned bridge crosses a wetland area on an unnamed tributary at this location.	N/A	N/A	N/A
8	This point is located on the SR-926 bridge. Riparian buffer enhancements are installed upstream of this point on an unnamed tributary that drains to the stream from the north.	N/A	N/A	N/A
9	A horse pasture is located upstream of this point and extends to the SR-926 bridge. The livestock have direct access to the stream.	Streambank fencing, riparian buffer enhancement, stabilized watering areas	Landowner, Conservation District, NRCS	High Priority
10	Upstream of this point, the western streambank is mowed to the top of the bank.	Riparian buffer enhancement	Landowner, TreeVitalize	Low Priority
11	The stream channel in this headwaters section is stable and intermittent. Roadway storm drainage flows through a maintained grass swale. Downstream the channel flows through a naturalized area and is well buffered and stable.	Create a bioretention swale along the roadway	Longwood Gardens	Low Priority
12	A 6 inch iron pipe drains to the stream from the south in this location and was likely a tile drain. This area appears to have been tiled and ditched in the past.	N/A	N/A	N/A



Kennett Area Park Authority (KAPA)

- KAPA owns & manages Anson B. Nixon Park
 - 106 acres – open space – 79 in Kennett Township, 27 in Kennett Square Borough
 - Two ponds (6 acres)
 - 4,400 linear feet of stream/tributaries (East Branch Red Clay Creek)
- Serving an estimated 170,000 people annually
 - Kennett Township, Borough of Kennett Square, & surrounding municipalities
- Open sunrise to sunset daily with varied amenities in addition to open space
 - Walking trails (2.5 mi.), fishing, 6 picnic pavilions, event stage, 18-hole disc golf course, tennis, volleyball, basketball courts, athletic fields
- Annual events attract visitors to the area,
 - Trout Rodeo, FREE Summer Concert Series, numerous sponsored 5K/Fun Run/Walks, and more



E MARLBOROUGH
TOWNSHIP

US ROUTE 1

N WALNUT RD

LESLIE RD

20

EXISTING
BASEBALL
FIELD

FUTURE SOCCER
EXPANSION AREA

EXISTING SOCCER
FIELDS

Main Park
Entrance

KENNETT
TOWNSHIP

KENNETT
SQUARE BOROUGH



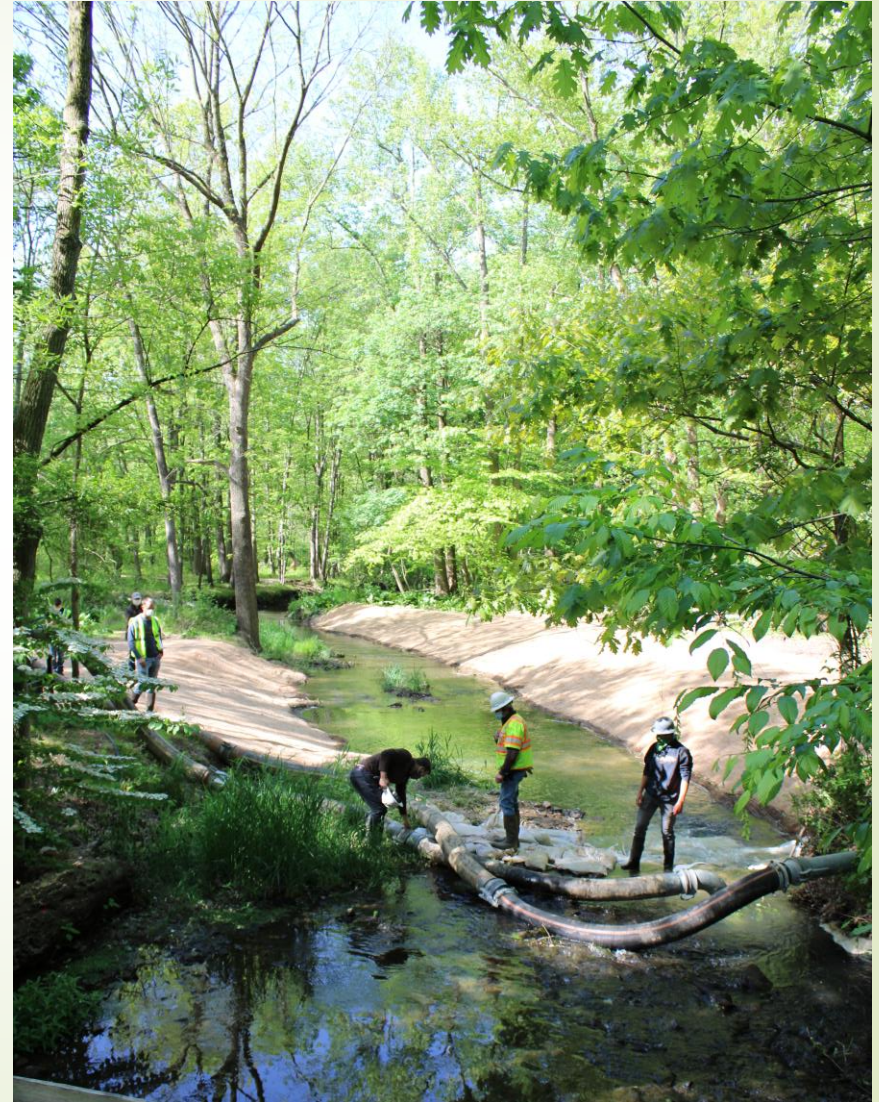
Kennett Area Park Authority Role in Stream Restoration

► Facilitation

- Experienced stream erosion impacting open space and trails
- Reached out to BRC to assess likelihood of project in park as part of a regional restoration underway
- Met with CCWRA, BRC, and two municipalities to discuss partnership opportunities
- A win-win-win project for all:
 - restored stream & bank stabilization in park
 - protection of open space and trail preservation;
 - BRC restores another portion of the Red Clay watershed;
 - Kennett Township and Kennett Square Borough get MS4 credits and help clean our waterways

► In-kind and Volunteer Efforts

- Construction monitoring
- Riparian stream plantings
- Stream clean-ups
- Community outreach
- Built community goodwill and a sense of shared accomplishment





➤ Design Phase:

- Funded by Growing Greener Grant to Kennett Area Park Authority
- Completed by Clauser Environmental, LLC
- Included DEP Permit Pre-application Meeting at SE office, and MS4 review to insure eligibility for sediment reductions
- Project broken into 2 Phases for funding and management.



➤ **PROJECT TIMELINE:**

- Design and Permitting Phase- completed 2018
- Grant Writing- 2019
- Phase 1 Construction- spring/summer 2020
- Phase 2 Construction- spring/summer 2021
- Riparian Plantings- Spring and Fall 2021



- **Funding received:**
 - \$77,500 **Growing Greener Grant** to KAPA for project design
 - \$250,000 **National Fish and Wildlife Foundation- Delaware Watershed Conservation Fund** grant to BRC for Phase 1 (US Fish and Wildlife, federal funding)
 - \$203,515 **Growing Greener Grant** to KAPA for Phase 2
 - \$100,000 **Kennett Township (60%) and Borough of Kennett Square (40%)**
 - Additional planning support from the **William Penn Foundation**



➤ MS4 PLANNING

- Kennett Township needed 100 tons of sediment reduction for revised plan
- Linear ft. of stream restored is 34% in Township and 66% in Borough boundaries
- Township negotiated with Borough to pay 60% of match and take credit for 60% of reductions, Borough paid 40%.
- DEP allowed stream restoration in neighboring municipality to be included in township's plan

AFTER COMPLETED STREAM RESTORATION IN PHASE 1



Contacts:



**Brandywine
Red Clay Alliance**

Watershed Conservation | Environmental Education

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