

East Branch Spring Creek Habitat Improvement Project
Western Pennsylvania Conservancy
Final Report

Project Background

The Spring Creek watershed in Forest and Elk counties is a major tributary of the federally designated *Wild and Scenic* Clarion River. The forests and waters of the entire Clarion River watershed are recovering from decades of unsustainable timber harvesting and industrial development that lead to species' extirpations. This project's implementation aimed to mimic natural aquatic habitat conditions in this section of East Branch Spring Creek (EBSC), decrease erosion and sedimentation, and support its function as headwater refuge and spawning grounds for trout and other coldwater species within the Clarion River system.

The EBSC watershed in Highland Township, Elk County, is a High-Quality Cold Water Fishery that supports a naturally reproducing (wild) trout population. The mile-long project reach was identified by Western Pennsylvania Conservancy (WPC) and the U.S. Forest Service (USFS) as an area in need of aquatic habitat improvements and bank stabilization. By reintroducing large woody materials (LWM) to the stream and floodplain, this project reduces erosion and sedimentation, improves aquatic habitats, restores a more natural flow regime, and serves as a model for aquatic large wood restoration in Pennsylvania.

National Environmental Policy Act (NEPA) review was completed and approved for this section of EBSC. The LWM structures were designed cooperatively by WPC's Watershed Manager and Scientist for the upper Allegheny River region, the USFS Hydrologist at the Allegheny National Forest, and the National Aquatic Organism Passage & Restoration Team Leader at USFS's National Stream and Aquatic Ecology Center. The project was permitted by the U.S. Army Corps of Engineers and PA Department of Environmental Protection as a Chapter 105 Environmental Assessment and Restoration Waiver. The PA Fish and Boat Commission was also closely involved in the design and permitting process; and their habitat managers assisted during implementation of this project to gain valuable hands-on experience in the application of LWM restoration techniques. Implementation was also assisted by the Elk, McKean, and Warren county conservation districts; members of the Allegheny Mountain, Cornplanter, James Zwald, and Seneca chapters of Trout Unlimited; and interns from the AmeriCorps National Service Program, Youth Conservation Corps, and Student Conservation Corps.

Project Outcomes

During implementation of this project, 25 LWM structures were added to East Branch Spring Creek and its adjacent floodplains throughout a one-mile-long project reach. These structures were comprised of 77 cut logs and 60 intact root wad logs, which were harvested on site and strategically placed to stabilize 1,955 feet of stream banks. These structures stabilized eroding stream banks, trapped sediment and debris during flood events, and created scour pools in the stream. The creation of a greater quantity and diversity of sizes and depths of pools provides habitat for a wide range of aquatic organisms and different species and age classes of trout. The smaller stems and debris that are trapped in the large wood structures partition the habitat within the pool of that structure, improving the overall holding capacity of the creek within the project reach. A comparison of pre- and post-restoration fish surveys documented an increase in species

richness and the abundance of trout. Logs that span the entire channel width and were secured on both banks of the creek also serve as natural bridges and roosts for terrestrial wildlife and birds.

Pre vs. Post Fish Habitat (logjam) Construction Changes in East Branch Spring Creek				
Note: Fish captured, total effort, and reach length were summed across sites for the pre and post analysis. Water quality data was averaged across sites.				
Pre-Construction		Post-Construction		
Fish Captured		Fish Captured		
Species	Total Individuals Captured	Species	Total Individuals Captured	
Sculpin	236	Sculpin	65	
Blacknose Dace	65	Blacknose Dace	43	
Creek Chub	15	Creek Chub	19	
White Sucker	9	White Sucker	11	
BKT	11	BKT	12	
BWN	8	BWN	31	
		River Chub	2	
		Pumpkinseed	1	
Effort (Seconds)	4159	Effort (Seconds)	6381	
Total site Length	348	Total site Length	542	
CPUE (Trout/Second)	0.00456	CPUE (Trout/Second)	0.0067	
		CPUE %difference from Pre	48%	
Trout/meter	0.05459	Trout/meter	0.0793	
		Trout/Meter % Difference	45%	
CPUE (Brook Trout/Second)	0.00264	CPUE (Brook)	0.0018	
		CPUE %difference from Pre	-29%	
CPUE (Brown)	0.00192	CPUE (Brown)	0.0048	
		CPUE %difference from Pre	153%	
				Δ
Water Temp	11.17	Water Temp	12.55	1.38
				%Δ
pH	8.04	pH	8.13	0.09
				12%
DO	10.56	DO	9.235	-1.32
				-13%
Cond	93.37	Cond	84.9	-8.47
				-9%
TDS	66.40	TDS	60.25	-6.15
				-9%
Alk	30.00	Alk	35	5.00
				17%

Soil bioengineering techniques were employed to further stabilize the site and provide long-term erosion and sediment control benefits. Through the help of volunteers from local chapters of Trout Unlimited, Elk County Conservation District (ECCD), and Warren County Conservation District, live stakes were cut from source trees and shrubs at the site, soaked, and transplanted in and throughout the disturbed areas. Additionally, 195 native trees were donated to the project by Ernst Conservation Seeds, and were planted in the areas disturbed by equipment

during tree harvest and construction along the creek. This helped to stimulate the revegetation process and provided training to volunteers and conservation district staff on the applications of this conservation technique, providing technical assistance to organizations dedicated to protecting coldwater ecosystems.

WPC has secured \$8,473.47 in cash match from the USFS as well as \$20,992.05 worth of in-kind volunteer labor and donated materials in support of this project. Two water quality data loggers belonging to the Elk County Conservation District were deployed to monitor temperature and conductivity in the project reach throughout the duration of this project.

Outreach and Education

The project site’s remote location and singular land owner (USFS) made this a prime location for the demonstration of aquatic large wood restoration techniques, which are still somewhat novel to Pennsylvania. Explaining the structures and their benefit to the stream, the biota, and communities downstream will foster a greater public understanding of watershed characteristics and how they affect coldwater ecosystems. An interpretive sign was installed along the Pigs Ear ATV trail adjacent to the project reach. The USFS reported 5,000–6,000 recreationalists using the trail will have the opportunity to learn about the functional role LWM plays in an aquatic ecosystem. The Pennsylvania Great Outdoors Visitors Bureau covered the project with a blog post (<https://visitpago.com/alleggheny-national-forest-stream-reclamation-project/>) and later coordinated a television spot on channel ABC23’s “Kaleidoscope the Series,” (<https://www.youtube.com/watch?v=Kx0iUGzchbU>). A short video was also created by the U.S. Forest Service for social media sharing that provided a glimpse into the project and this restoration approach (https://www.youtube.com/watch?v=SDbqT101A_M). At the onset and during completion of the project, an overview of the project and the techniques used in it was presented cooperatively by the USFS and WPC to several local chapters of Trout Unlimited and their members. In total, 37 individuals were engaged and educated through this outreach effort. These presentations were also used as a mechanism of recruiting volunteers to assist with implementation of the project.

Trout Unlimited Chapter	Date Presented	Number of Attendees
Allegheny Mountain	February 21, 2017	10
Cornplanter	February 28, 2017	10
James Zwald	April 25, 2017	5
Seneca	May 3, 2017	12

East Branch Spring Creek Habitat Restoration Project

This photo compilation captures the site of Structure 9 in the East Branch Spring Creek Habitat Restoration Project before, during, and after construction.



Photo 1: ATV Trail Bend on East Branch Spring Creek: Erosion, rock armoring present. Habitat lacking. May, 2014.



Photo 2. Bend and downstream area: Additional erosion. May, 2014



Photo 3. Bank from downstream, during higher flow. April, 2015.

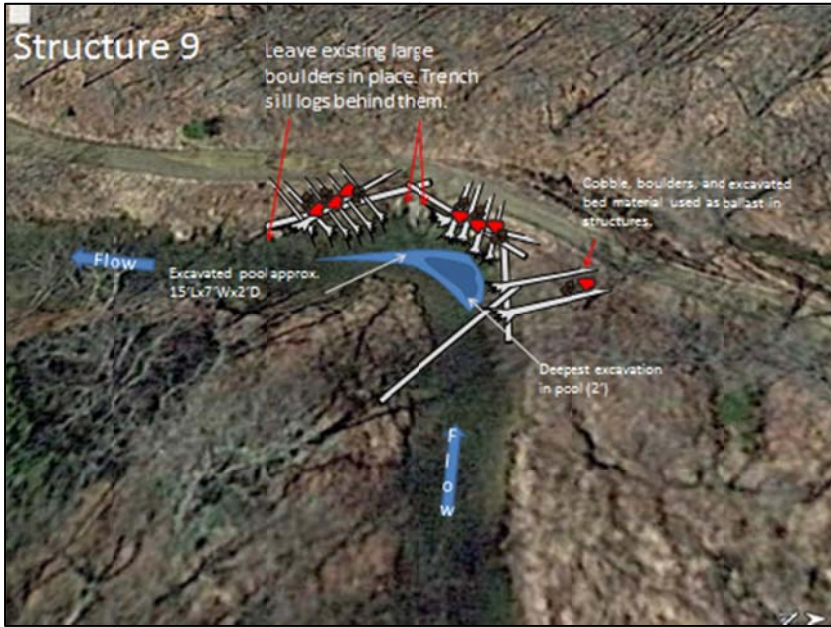


Figure 1. Structure Design



Photo 4. Rootwad installation. September, 2017.



Photo 5. Structure 9 from downstream. February, 2018.

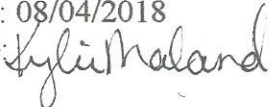


Photo 6. Informational sign at Structure 9. April, 2018.



Photo 7. Structure 9, looking upstream from bend. July 2018.

Coldwater Heritage Partnership Final Budget Report

1. Organization Name: Western Pennsylvania Conservancy (East Branch Spring Creek Habitat Improvement Project)
2. Grant Amount: \$7,000.00
3. Assurances Document signature date: 02/04/2017
4. Project completion date: 08/04/2018
5. Main Contact Signature: 

LINE ITEM	DESCRIPTIONS/DETAILS/ EXPLANATIONS	ACTUAL CHP GRANT FUND EXPENDITURES	ACTUAL LOCAL CONTRIBUTIONS	
			CASH	IN-KIND
SALARY AND BENEFITS (PLEASE BE SPECIFIC)	WPC WATERSHED STAFF: Project and volunteer coordination; design; permitting; construction oversight	\$1,505.16	\$4,209.52	
	VOLUNTEER LABOR: Construction and monitoring			\$2,962.80
TRAVEL (PLEASE BE SPECIFIC)	WPC MILEAGE: Project planning, design, and implementation	\$394.84		
EQUIPMENT & SUPPLIES (PLEASE LIST EACH ITEM. ATTACH A SEPARATE SHEET IF NECESSARY.)	MONITORING EQUIPMENT: BACKPACK FISH SHOCKING EQUIPMENT USE (2 DAYS)			\$528.00
	CONSTRUCTION TRAILER: HAND AND POWER TOOLS USE (5 DAYS)			\$1,300.00
	GRIPHOIST (WINCH) PURCHASE		\$4,263.95	
CONSTRUCTION (PLEASE BE SPECIFIC)	CONTRACTUAL SERVICES	\$5,100.00		
	CONSTRUCTION MATERIALS: LOGS AND ROOT WADS HARVESTED ON-SITE; LIVE POTTED TREES DONATED BY ERNST SEEDS			\$16,201.25
OTHER				
TOTAL		\$7,000.00	\$8,473.47	\$20,992.05