

Browns Run Habitat Improvement Project
Western Pennsylvania Conservancy
Final Report

Project Background

The Browns Run Habitat Improvement Project aimed to enhance habitat diversity and connectivity along 2,400 feet of Browns Run near its confluence with the Allegheny River. This project was a direct recommendation of the *Browns Run Coldwater Conservation Plan* (WPC 2011) that identified a need for stabilizing eroding banks while providing improved aquatic habitat in the lower reaches of Browns Run. The project site was to be located behind the Dairy Delight ice cream and mini-golf business along Rt. 6 just east of the City of Warren, in Mead Township, Warren County, and continue upstream past the waste water treatment facility and recreation park owned by the Kinzua-Warren Joint Authority. However, the project length was shortened when the landowner of the downstream half of the project considered selling his business and did not want the deed to be bound by the conditions of a landowner-grantee agreement. Therefore, we proceeded with implementing the upstream half of the project that is open for public access via the Mead Township Recreation Park.

Browns Run, and its major tributaries—Dutchmen Run and Morrison Run—all support wild trout reproduction and are designated Exceptional Value (EV) waterways in their densely forested headwater origins. However, as their waters flow further down the system, particularly in the lower reaches of Browns Run, the stream is heavily influenced by residential, commercial, and infrastructure development along Rt. 6. In this area, the stream loses its special protection status and is designated a Cold Water Fishery, due in part to a lack of riparian and bank vegetation to shade and cool the water and reduce erosion and sedimentation. This area also lacks in-stream habitat complexity like pool variability, large woody material, and clean substrate. This project area near the confluence of Browns Run provides a critical linkage for fish and other aquatic organisms traveling from the Allegheny River to the EV areas upstream in the headwaters. Restoration measures were needed to stabilize the eroding banks and improve the availability of cover and holding areas for trout and other species to make the trek to more ideal conditions upstream for reproduction and survival in the hot summer months.

The Conservancy and local partners, including the Cornplanter Chapter of Trout Unlimited, Warren County Conservation District (WCCD), PA Fish and Boat Commission (PFBC), the U.S. Forest Service – Allegheny National Forest, and American Rivers have successfully raised more than \$123,000 to complete 10 projects to improve fish passage, stabilize eroding stream banks, enhance the quality and availability of in-stream and riparian habitat, and remediate sources of water quality degradation like sediment runoff from dirt and gravel roads throughout the Browns Run watershed, particularly in the EV Morrison Run sub-watershed. Most notably, two dams were removed near the mouths of Morrison Run (2011) and Dutchmen Run (2016) to enable fish passage into those vital headwater streams. These same partners collaborated on this project to continue to improve the overall health and ecosystem functioning of the Browns Run watershed by assisting the Township with installing fish habitat improvement devices that will also serve the dual purpose of providing stream bank protection from erosion. In addition, intensive plantings of quick-rooting trees like willow and dogwood—a method of vegetative bank stabilization termed “soil bioengineering”—were incorporated into and in-between constructed

devices to provide resilient, long-term stabilization of the banks and improve riparian habitat and water quality by shading the stream and providing food in the form of leaves for aquatic insects that fish thrive on. By incorporating living plant materials in the restoration structures that will naturally regenerate after damage and spread to colonize surrounding areas, this project will require little, if any, maintenance beyond the terms of this grant.

Project Outcomes

PFBC provided a restoration design for the project that, for this half of the project, included 10 in-stream habitat enhancement structures, including one modified muddsill, two log-framed stone deflectors and seven multi-log deflectors, as well as vegetative bank protection. In June 2018, WPC, PFBC, WCCD, and the Cornplanter Chapter of Trout Unlimited constructed those 10 structures along 1,000' of Browns Run to improve stream bank protection and add in-stream cover and habitat diversity. This project occurred on property owned by Meade Township near the Kinzua-Warren County Joint Authority's wastewater treatment plant. The property is park-like in nature, with baseball fields and easy public access to the stream for recreation. In support of this fish habitat improvement project, ANF staff supported riparian plantings through funds donated by the Pittsburgh Garden Club in spring of 2019. The project partners planted eight trees and 27 shrubs in the previously disturbed heavy equipment access areas. Species planted included black locust, Aronia, serviceberry, blueberry, and elderberry. These species were selected to improve diversity of the riparian species assemblage, as well as provide food for wildlife and people recreating along this section of Browns Run. One-hundred supplemental live stem cuttings from willow and dogwood source plants available on the site were transplanted into the disturbed areas of the bank as well, to offer long-term vegetative stabilization and further enhance the habitat value of the riparian area.



BEFORE: This section of Browns Run is devoid of in-stream cover and lacks habitat diversity



AFTER: A log-framed stone deflector (right foreground) and modified mudsill (right background) provide bank stabilization and improve habitat diversity and cover for fish



Thirty-five trees and shrubs were planting along the top of the bank and 100 live stakes were transplanted to provide long-term vegetative stabilization and enhanced habitat value to the riparian area



A multi-log vane deflector protects the bank from erosion and creates a self-flushing scour pool for fish habitat

WPC Browns Run CHP Implementation
Appendix A

Grant Reporting Guidelines

All grantees are required to complete a final report and final expense form upon completion of the project. CHP Implementation projects are unique as are their outcomes, outputs, and measures of success. However, the following information will be expected as part of the final project report:

- Information about the Public Meeting held after receiving the grant and prior to beginning the project
 - a. Date and Location of Meeting 10/24/17 at the Jefferson Defrees Family Center, Warren.
 - b. Organizations represented by attendees (you do not need to share names or emails in order to protect privacy) Cornplanter Chapter of Trout Unlimited, U.S. Forest Service, PA Fish and Boat Commission, and the Allegheny Watershed Improvement Needs (WINs) Coalition.
- Before and after photos of the project site(s) [see final report](#)
- Project summary

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- Project outcomes
 - a. Were all project objectives met?

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b. If not, which ones and why not?

Originally, 2,400 feet of habitat improvements were designed and planned for this project on Browns Run. However, due to the project site being on two separate properties and the one private landowner of the downstream portion of the site being unwilling to sign a landowner commitment letter, the project was shortened. A total of 1,000 feet of habitat improvements were made on the upstream portion of the project that is open to the public via ownership by the Kinzua-Warren Joint Authority and managed as a recreational baseball fields park.

c. Is project considered complete? If not, what remains to be accomplished?
Yes, this project is considered complete.

• Project sustainability

a. Discuss the long term sustainability of the project as implemented. What are potential threats to sustainability?

The habitat structures constructed in Browns Run are expected to have a service life of at least 20 years. Soil bioengineering techniques, primarily live plant stakes, were used to amend the structures to offer long-term sustainability at the site. The live stem cuttings were from plants, such as willows and dogwoods, that naturally occur on stream banks and are adapted to withstand damage caused by floods and ice scour. That natural resilience and ability to self-heal and even spread to further secure the subsurface soil with their ever-growing network of roots will add to the structural integrity of the project and the long-term sustainable benefits it will provide.

b. Monitoring, operation and maintenance plans.

The habitat improvement devices operate passively with the flow of the stream. They are designed to create a self-scouring effect on the stream bottom to help flush sediment below the structures and to capture sediment to rebuild the stream bank above the structures. They do not require maintenance unless the structures are damaged. As time and funding allow, the project partners led by the local volunteer entity, Cornplanter Chapter of Trout Unlimited, will occasionally monitor the performance and structural integrity of the devices. These findings will be shared at regular meetings of the Allegheny WINs Coalition, where any maintenance or repair needs will be discussed with the project partners to devise a fundraising strategy at that time.

The soil bioengineering plants and riparian trees will be maintained by the grounds crew of the Kinzua-Warren Joint Authority and Mead Township. Any needs beyond regular pruning and care will be reported to WPC to share with the project partners to devise a repair plan and fundraising strategy.

• Next phase or future projects

a. Would this project benefit from an additional "phase?" Describe any future efforts that would increase the benefits of current project.

The downstream landowner's hesitation to sign a long-term commitment was primarily due to his interest in selling the property upon his imminent retirement from his small ice-cream business at that site. A habitat restoration design for that property has already been completed by the PA Fish and Boat Commission and is on file with WPC should any future landowner(s) wish to cooperate on the project and implement that design (or a revised version of it should site condition changes warrant a revision). WPC and the Cornplanter Chapter of Trout Unlimited will continue to work with other neighboring property owners upstream on Browns Run and its tributaries, Morrison Run and Dutchmen Run, to design and complete other habitat improvement and fish passage goals in the watershed as identified in the coldwater conservation plan.

Currently, we are actively engaged with two landowners on either side of Morrison Run near its mouth on Browns Run to stabilize eroding stream banks and improve in-stream habitat. The project partners also implement annual habitat improvements in the headwaters of Morrison Run every September and plan to continue that effort, which affords members of the Cornplanter Chapter of Trout Unlimited an opportunity to actively participate in conservation efforts.

- List partners and volunteers and describe their involvement in the project including number of people, number of donated or in-kind hours, etc.

The PA Fish and Boat Commission provided the restoration design for this project and assisted with construction oversight. The Cornplanter Chapter of Trout Unlimited and Western Pennsylvania Conservancy served as the landowner liaisons and spearheaded the fundraising efforts for this project. The Cornplanter Chapter of Trout Unlimited secured a grant from the Foundation for PA Watersheds for \$10,000, which contributed to the contractor services and materials for the project. Western Pennsylvania Conservancy secured this CHP grant, as well as Colcom Foundation funding, and coordinated the implementation of the project. The U.S. Forest Service and the Allegheny WINs Coalition promoted the project, helped recruit volunteers, and supported fundraising efforts.

A total of 13 volunteers from the Cornplanter Chapter of Trout Unlimited, Warren County Conservation District, the Warren County Summer Youth Conservation Camp, and Mead Township contributed 92 hours of labor valued at \$2,339.56 to the project. Those volunteers assisted with constructing the in-stream habitat devices and planting soil bioengineering live stakes and riparian trees. The Kinzua-Warren Joint Authority and Mead Township grounds crew also assisted with site preparation by clearing brush for equipment access prior to construction and preparing a staging area for materials at the park.

- Accomplishments and Outputs
 - a. Observed or measured improvement to overall condition of the stream or watershed.

Post-restoration monitoring of fish populations had to be postponed due to site conditions (high water) at the time of the scheduled monitoring event in 2019. Therefore, no fish community data is available at the time of this report. However, trout were visually observed near the habitat structures during tree plantings. The once-eroding, bare-soil stream banks have improved and are now observed to be secure with stone armoring and vegetative growth from the live stakes, as well as native riparian herbaceous seed that was planted after construction. The tree species diversity at the site has increased to include black locust, Aronia, serviceberry, blueberry, and elderberry, which were not present at the site beforehand.

- b. Riparian buffer projects and natural stream channel projects:
 - i. Number of linear feet/acres improved? 1,000' _____ (for buffers remember to account for both stream banks if applicable)
 - ii. Number of trees planted, if applicable 135
 - iii. Number of structures placed, if applicable 10

- c. Preservation Projects:
 - i. Number of linear feet of stream and/or acres preserved

N/A