Snitz Creek 3 - Stream and Floodplain Restoration
Nonpoint Source Management 319 Program Contract # C990005379
Growing Greener Grant Contract # C990005610
Sponsor: Doc Fritchey Trout Unlimited

Project Description The Snitz Creek 3 Stream and Floodplain Restoration Project is on Elizabeth Run, a first order tributary to Snitz Creek in the Quittapahilla Creek Watershed located in Cornwall Borough, Lebanon County, PA. Elizabeth Run is an intermittent stream carrying baseflow for eight to nine months each year. It is the third ranked project on the priority list for the Snitz Creek watershed in the Quittapahilla Watershed Implementation Plan (2021). The Project started downstream of Culvert Street and ended at Cornwall Road.

The reaches along Elizabeth Run were historically straightened to allow maximum use of the fields along both sides of the channel for hay production. The stream reaches through the entire project area were unstable due to meander redevelopment and maintenance of riparian vegetation. Stability problems included tight meander bends, significant bank erosion, debris jams, heavy sedimentation and aggradation (lateral and mid-channel bars). A large number of undercut and leaning trees were falling into the creek creating debris jams which further accelerated the bank erosion and aggradation. The increased sedimentation had significantly degraded in-stream habitat. An Unnamed ephemeral tributary entered this reach immediately downstream of Culvert Street. The dominant land use of the watershed draining to this tributary is approximately 60% cultivated land. According to the landowner, this tributary only carries flow during storm events but is a significant source of sediment to the Elizabeth Run. Two petroleum pipelines transect the project area, one owned and maintained by Enterprise TE Products Pipeline Company LLC and the other by Buckeye Partners, L.P. A section of the Enterprise pipeline was exposed by erosion of the streambed along the lower third of the project area.

Project Objectives This project proposed to restore approximately 1,000 linear feet of Elizabeth Run and 200 linear feet of the Unnamed Tributary. The restoration objectives were to create a stable meandering E4 stream channel along the upper and middle project reaches. Some channel adjustments were made to smooth out the tighter meander bends. Because the lower reach was more confined, the channel was restored as a stable B4c stream channel. It was relocated away from the petroleum pipeline where bank erosion threatened to expose it. Floodplain restoration included lowering the adjacent floodplain to bankfull elevation and creating a 1.2 acre wet meadow, emergent and scrub-shrub wetland along the restored floodplain. The Unnamed Tributary was rerouted across the wetland to capture and provide water quality treatment for runoff from the cultivated agricultural fields draining into the tributary.

Project Results The project restored 1,000 linear feet of Elizabeth Run by creating a stable, gently sinuous stream channel along the project reaches. Channel stabilization included an imbricated rock wall downstream of the Culvert Street culvert; toe benches with soil lifts along the meander bends to construct new lower and stable banks; constructed riffles and boulder runs to provide grade control and create in-stream habitat, seeding with native grasses and wildflowers; coir matting along graded streambanks. A 1.0 acre riparian buffer with native trees and shrubs was established along the channel and perimeter of the Project Area to filter runoff and stabilize the slopes at the edge of the water quality wetland.



Pre-Construction



Channel Post-Construction



Wetland Post-Construction

Project Costs Nonpoint Source 319 Grant - $457,727 and Growing Greener Grant - $330,408; Total - $788,135

Partners Doc Fritchey Trout Unlimited, Quittapahilla Watershed Association, Clear Creeks Consulting, Ecosystem Planning and Restoration and Kinsley Construction.

Contact Information Doc Fritchey Trout Unlimited, Russ Collins at russ@dftu.org

Project Photographs.

Upper Reach Pre-Construction



Photo 1 – Culvert outfall at Culvert Street



Photo 2 – Split channel, lateral bars and eroding banks



Photo 3 – Eroding bank with undercut tree



Photo 4 – Eroding bank with undercut trees



Photo 5 – Bank erosion along meander bend



Photo 6 – Eroding bank with undercut trees

Upper Reach During and Post-Construction



Photo 7 – Imbricated rock wall at Culvert Street



Photo 8 – Imbricated rock wall at Culvert Street



Photo 9 – Restored channel with lowered floodplain



Photo 10 – Restored channel with lowered floodplain



Photo 11 – Restored channel with lowered floodplain



Photo 12 – Restored channel with lowered floodplain

Middle Reach Pre-Construction



Photo 13 –Fallen tree created debris jam and aggradation



Photo 14 – Eroding bank and debris jam



Photo 15 – Eroding bank and undercut tree



Photo 16 – Eroding bank and undercut tree

Middle Reach During and Post-Construction



Photo 17 – Restored channel with lowered floodplain



Photo 18 – Restored channel with lowered floodplain



Photo 19 – Restored channel with lowered floodplain



Photo 20 – Restored channel with lowered floodplain

Lower Reach Pre-Construction



Photo 21 – Eroding bank



Photo 22 – Eroding bank with undercut trees



Photo 23 – Eroding bank



Photo 24 – Debris jam and aggradation



Photo 25 – Culvert at Cornwall Road

Lower Reach During and Post-Construction



Photo 26 – Restored channel with lowered floodplain



Photo 27 – Restored channel with lowered floodplain



Photo 28 – Restored channel with lowered floodplain



Photo 29 – Restored channel with lowered floodplain



Photo 30 – Restored channel with lowered floodplain



Photo 31 – Restored channel with lowered floodplain

Unnamed Tributary and Hayfield Along Right Floodplain Pre-Construction





Photos 32 and 33 – Unnamed Tributary (Ditch along Culvert Street)



Photo 34 - Hayfield Along Right Floodplain

Relocated Tributary and Watter Quality Wetland During and Post-Construction



Photo 36 – Relocated Tributary Entering Wetland



Photo 37 – Relocated Tributary in Wetland



Photo 38 – Excavated hayfield to create Wetland



Photo 39 – Water Quality Wetland



Photo 40 – Excavated hayfield to create Wetland



Photo 41 – Water Quality Wetland