**Beck Creek 6 - Stream and Floodplain Restoration**

319 NPS Program Contract # 990004792

Sponsor: Doc Fritchey Trout Unlimited

Project Description Beck Creek is a tributary to Quittapahilla Creek in Lebanon County. Historically the stream reaches along the Weaver and Brummel Farms were relocated from the middle of the floodplain to its western edge and straightened. In this new location the channel received direct runoff from cultivated fields contributing significant loadings of sediment and nutrients. The channel and floodplain were severely impacted by unlimited livestock grazing and removal of riparian vegetation with rutting from cattle trails, trampling of streambanks, bank erosion, heavy sedimentation and debris jams. The increased sedimentation significantly degraded in-stream habitat. The Project was implemented to restore the stream channel and floodplain.

Project Objectives Create a stable meandering stream channel with excellent in-stream habitat that supports diverse macroinvertebrate and fish communities. Restore a badly damaged floodplain and create high value wetlands with diverse micro-topography, hydrologic regimes, and plant communities. Create an open water wetland impoundment that provides water quality treatment for runoff from the cultivated fields.

Project Results The restoration of Beck Creek created 2,125 linear feet of stable meandering stream channel including 1,025 linear feet of new channel relocated to the middle of a restored floodplain. Channel stabilization and in-stream habitat features included toe wood and soil lifts that protects the new banks and provides overhead cover for fish, constructed riffles and boulder runs that provide grade control and in-stream habitat for fish and macroinvertebrates.. The badly damaged old pasture land was converted to over 5.15 acres of high value wet meadow, scrub-shrub and forested wetlands. The open water and emergent wetland impoundment now captures and treats the runoff from the cultivated fields prior to entering Beck Creek. The entire 10.2 acre Project Area will be maintained as fish and wildlife habitat with a restored stream channel, floodplain and upland areas that include diverse riparian, wetland and upland plant communities.



Beck Creek Pre-Construction



Beck Creek Post-Construction

Project Costs 319 Nonpoint Source Grant - $766,021; LCCD ACAP Grant - $173,110; Total - $939,131

Partners Doc Fritchey Trout Unlimited, Quittapahilla Watershed Association, The Lebanon Valley Conservancy, Lebanon County Conservation District (LCCD), Clear Creeks Consulting and Ecosystem Planning and Restoration. Resource Restoration Group (RRG) was the Construction Contractor.

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

**Project Photographs**



Photo 1 – Route 322 Culvert Pre-Construction



Photo 2 – Route 322 Culvert During Construction



Photo 3 – Looking Downstream from Route 322 Pre-Construction
Note - Livestock Crossing (Yellow Arrows)



Photo 4– Right streambank and floodplain immediately downstream of Route 322 culvert
Note - Livestock trails along streambank (2001).



Photo 5 – Overwide section of Upper Reach (2021)



Photo 6 – Bank erosion along pipeline easement in Upper Reach (2021)



Photo 7 – Looking Downstream along Upper Reach During Construction



Photo 8 – Looking Downstream along Upper Reach from Route 322 Post-Construction



Photo 9 – Looking Upstream along Upper Reach Post-Construction



Photo 10 – Looking Downstream along Middle Reach (2001)



Photo 11 – Bank erosion and thick mats of aquatic vegetation along channel (2001)



Photo 12 – Thick mats of filamentous algae along over-wide channel section (2001)



Photo 13 – Overwide Section Middle Reach with heavy sedimentation (2021)



Photo 14 – Bank erosion along Middle Reach (2021)



Photo 15 – Split channel in Middle Reach (2021)



Photo 16 – Downstream end of Middle Reach with vegetated mid-channel bars (2021)



Photo 17 – Looking Downstream along Middle Reach Post-Construction



Photo 18 – Looking Upstream along Middle Reach Post-Construction



Photos 19 and 20 – Looking down valley at the Wetland Impoundment along the Middle Reach
Note: Goose Exclusion Fence and Netting to protect emergent vegetation on aquatic bench





Photo 21 – Freshwater intake pipe to Wetland Impoundment (red arrow)



Photo 22 – Freshwater intake pipe entering Wetland Impoundment (red arrow)



Photo 23 – Freshwater intake channel entering Wetland Impoundment (red arrow)



Photo 24 - Emergent vegetation on aquatic bench



Photo 25 – Freshwater outlet pipe from Wetland Impoundment (red arrow)



Photo 26 – Freshwater outlet channel from Wetland Impoundment to creek (red arrow)



Photo 27 – Debris jam and rock revetment at upstream end of Lower Reach (2021)



Photo 28 – Flow diversion to Brummel pond at upstream end Lower Reach (2021)



Photos 29 and 30 – Bank erosion upstream end of Brummel Property





Photos 31 and 32 – Bank erosion and undercut trees





Photo 33 – Bank erosion and undercut tree



Photo 34 – Bank erosion, fallen tree and debris jam



Photos 35 and 36 – Bank erosion and undercut tree





Photo 37 – Bank erosion at downstream end of Reach 2



Photo 38 – Backside of berm around Brummel Pond/Wetland Complex
Note - Because the berm was installed across the floodplain
it severely restricts conveyance of large storms down valley



Photo 39 – Typical Boulder Run along Lower Reach



Photo 40 – Typical Pool with Toe Wood along Lower Reach

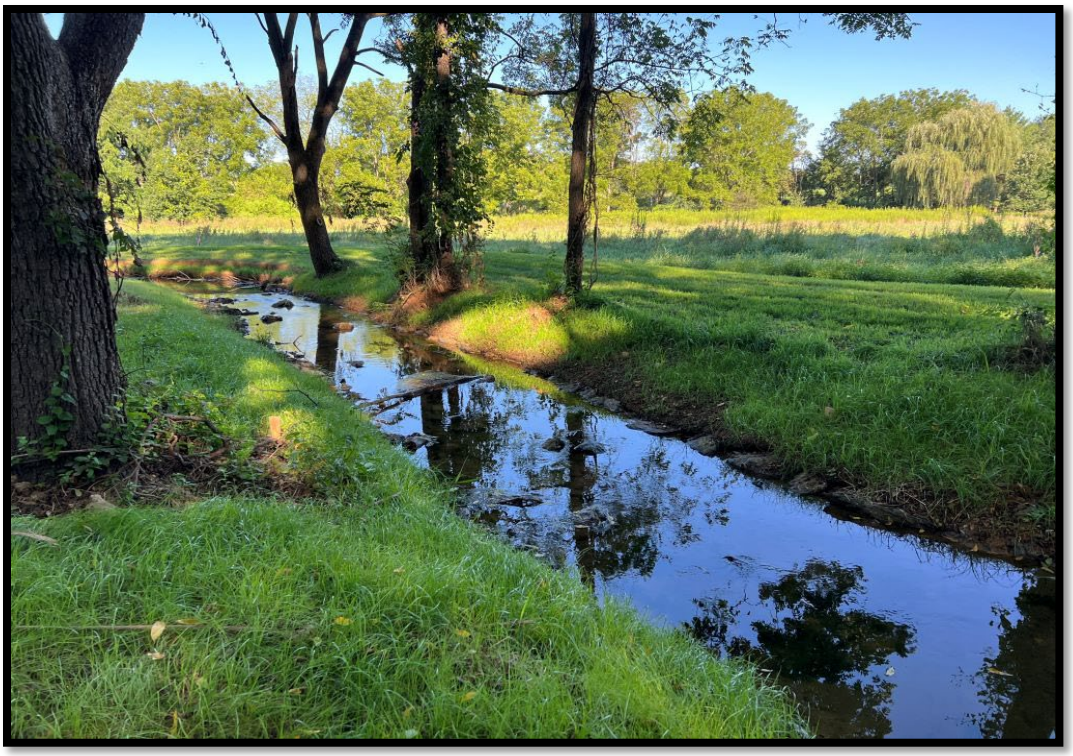


Photo 41 – Riffle and Pool along Lower Reach

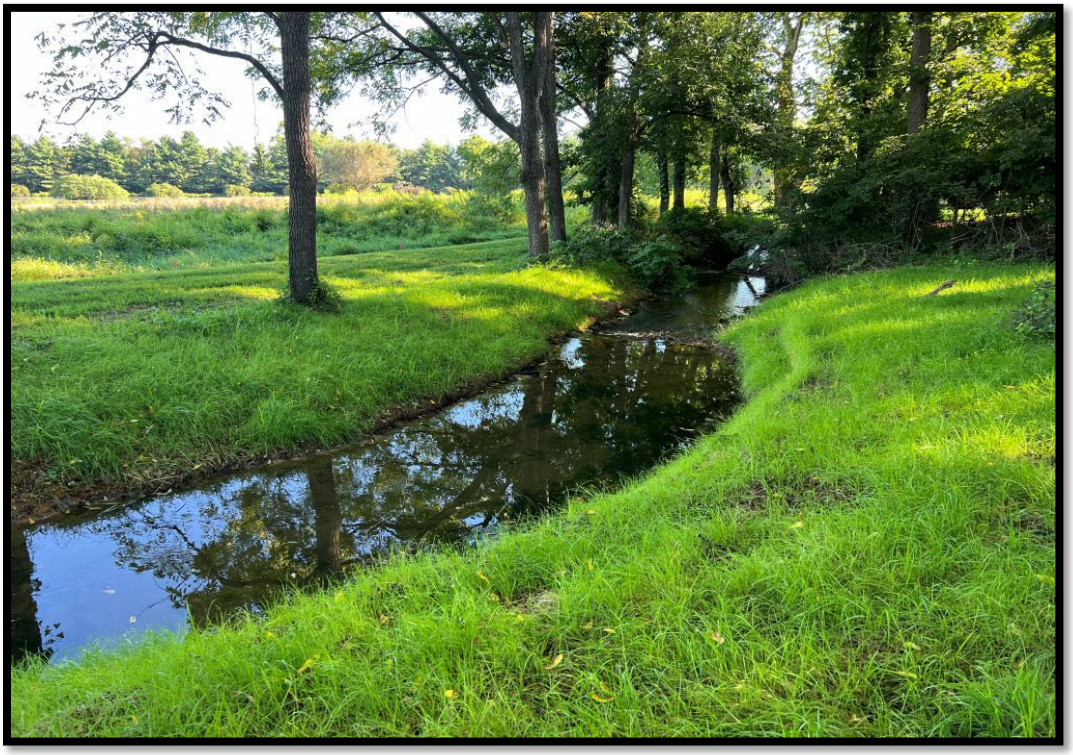


Photo 42 – Pool with Toe Wood along Lower Reach



Photos 43 and 44 – Scrub-Shrub Wetland along Restored Floodplain Pre-Planting





Photos 45 and 46 – Swale Connecting Scrub-Shrub Wetlands along Restored Floodplain Pre-Planting





Photo 47 – Scrub-Shrub Wetland along Restored Floodplain Pre-Planting



Photo 48 – Drone Aerial looking at Upper Reach taken by DFTU Post-Construction



Photo 49 – Drone Aerial taken by LCCD Staff during Construction looking down valley (Red Arrow Existing Channel and Green Arrow Relocated Channel)



Photo 50 – Drone Aerial taken by DFTU Post-Construction looking down valley (Red Arrow Wetland Impoundment, Green Arrow Relocated Channe, Yellow Arrows Scrub-Shrub Wetlands)



Photo 51 – Drone Aerial taken by LCCD Staff during Construction looking down valley (Red Arrow Existing Channel and Green Arrows Scrub-Shrub Wetland and Shallow Swale Conveying Spring Flow)