

# Beaver Creek Habitat Improvement and Sediment Reduction Project

July - August 2022

# Assessing the problem

In late 2019, BCCD visited a farm with Western PA Conservancy staff to assess the site for riparian planting planned for 2020. A conversation with the landowner introduced the possibility of installing stream devices to reduce erosion from the stream banks and improve fish habitat.

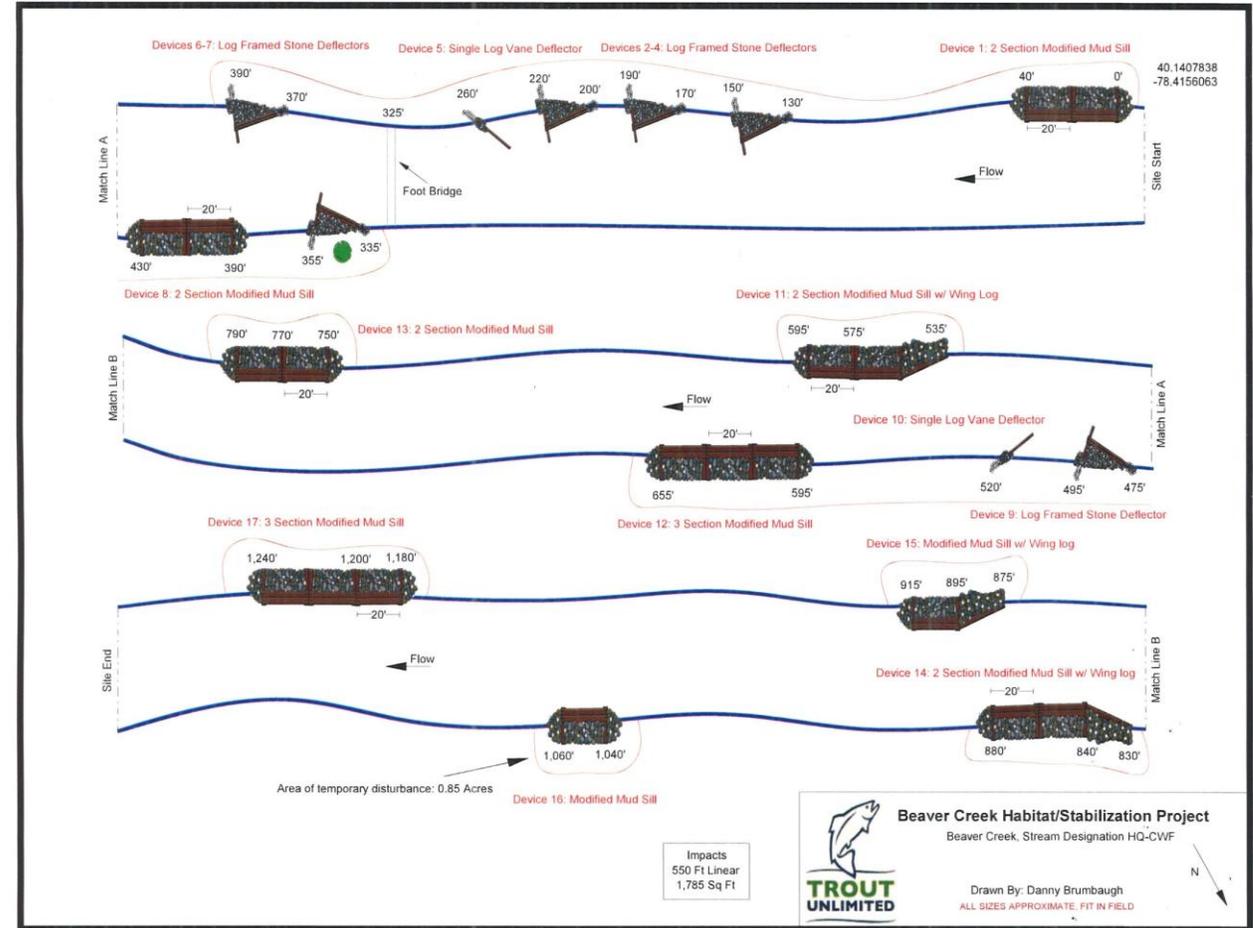
In January 2020, BCCD returned with Trout Unlimited stream habitat specialists to assess the possibility of a project on approximately 1300 feet of stream



Photos from January 13 visit with Trout Unlimited staff.

# The Plan

The National Trout Unlimited staff provided a plan that included a drawing of device locations, detail drawings of the device types, a materials list, and estimates of impacts and reductions. The project was estimated to cost just over \$36,000, stabilize about 1240 feet of streambank, and reduce sediments loads by 16,680 pounds or 8.34 tons per year.



# Permit and Funding

BCCD began working on the GP-1 Fish Habitat permit application in late 2020 and submitted the permit registration in February 2021.

A letter requesting additional information and a wetland field delineation was received on April 29<sup>th</sup>.

Wetland delineation completed at no charge by Keller Engineers, June 6, 2021

Permit authorization issued August 6, 2021

Fort Bedford Trout Unlimited (FBTU) was involved from the beginning of the project in requesting assistance from the National Trout Unlimited staff assigned to providing technical assistance in Pennsylvania.

When Chesapeake Bay Program Watershed Implementation Plan Phase 3 County Action Plan (CAP) funding became available, FBTU applied for \$40,000 to install the proposed project.

This funding was approved by the Department of Environmental Protection Bay office through the CAP Coordinator for Bedford County.

# Materials and Contractor

The plan provided by the Trout Unlimited staff included a materials list estimating project needs as follows:

97 hemlock logs of lengths 10', 15' and 20', 10" – 12" diameter

213 5/8" diameter rebar pins

130 tons of R5/R6 limestone riprap

After the stone was delivered to the worksite, a loader and track truck were used to stage rock at locations close to where devices would be constructed.



# Construction

Construction began on July 28, 2022, at the upstream part of the project (above the footbridge). Three log-framed stone deflectors were installed along the eroding southwest bank.



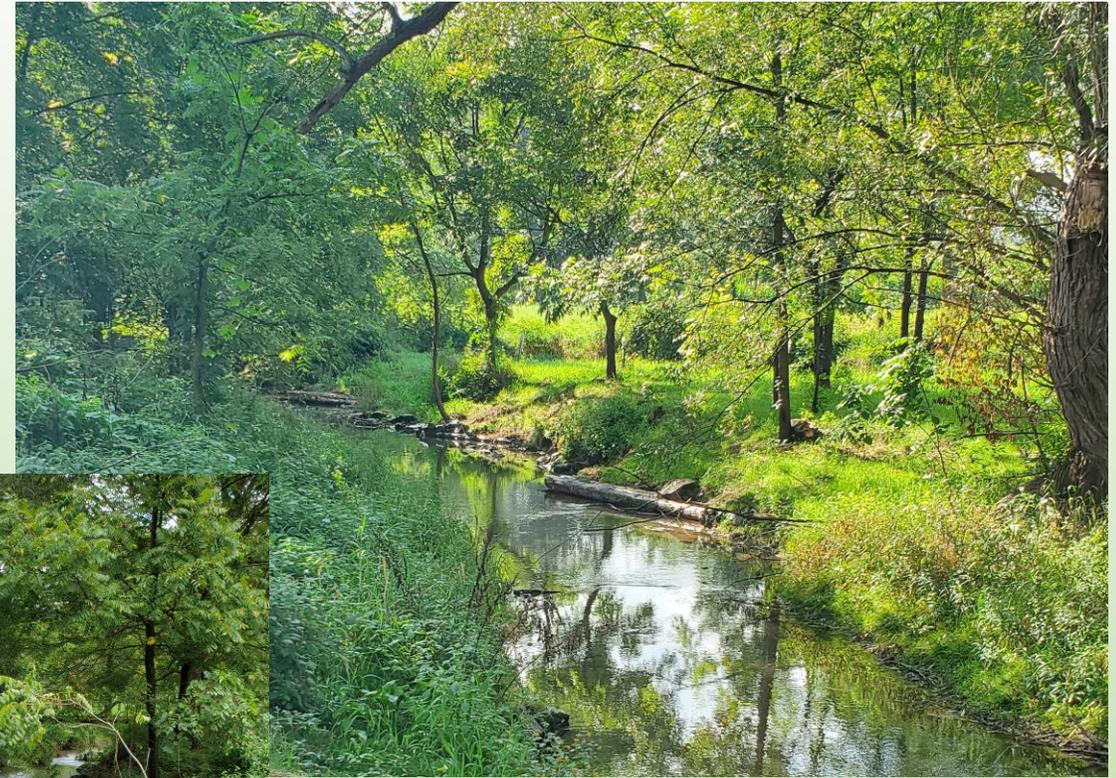
Photos of eroded streambank, ↑  
January 13, 2020 ↓



View of a completed deflector, before seeding and mulching, July 28, 2022.

# Construction

These photos were taken more than a month after the initial work on this section of the project, and after heavy rains in the area, hence the turbidity. The areas with shorter grass were disturbed during construction and were seeded and mulched when work was complete.



These photos show the 3 deflectors that were the first devices placed in the last days of July. (Photos taken September 8, 2022)

# Construction

Also constructed in the upstream portion of project were 2 small single log vanes and a modified mudsill.



These 2 photos from 2020 show the undercut bank where the modified mudsill would be constructed. At the time of construction, the erosion had undercut the stream bank as far as the fence wire and threatened the fence posts.

# Construction

No photos were taken during construction of this first mud-sill but the image below shows the site when the seeding and mulching was complete.

August 27, 2022 →



August 2, 2022 ↑

September 8, 2022 →



# Construction

Work below the footbridge began on August 2, with construction of a series of log-framed stone deflectors and log vanes along the southeast stream bank where erosion was occurring. Photos below from August 2.

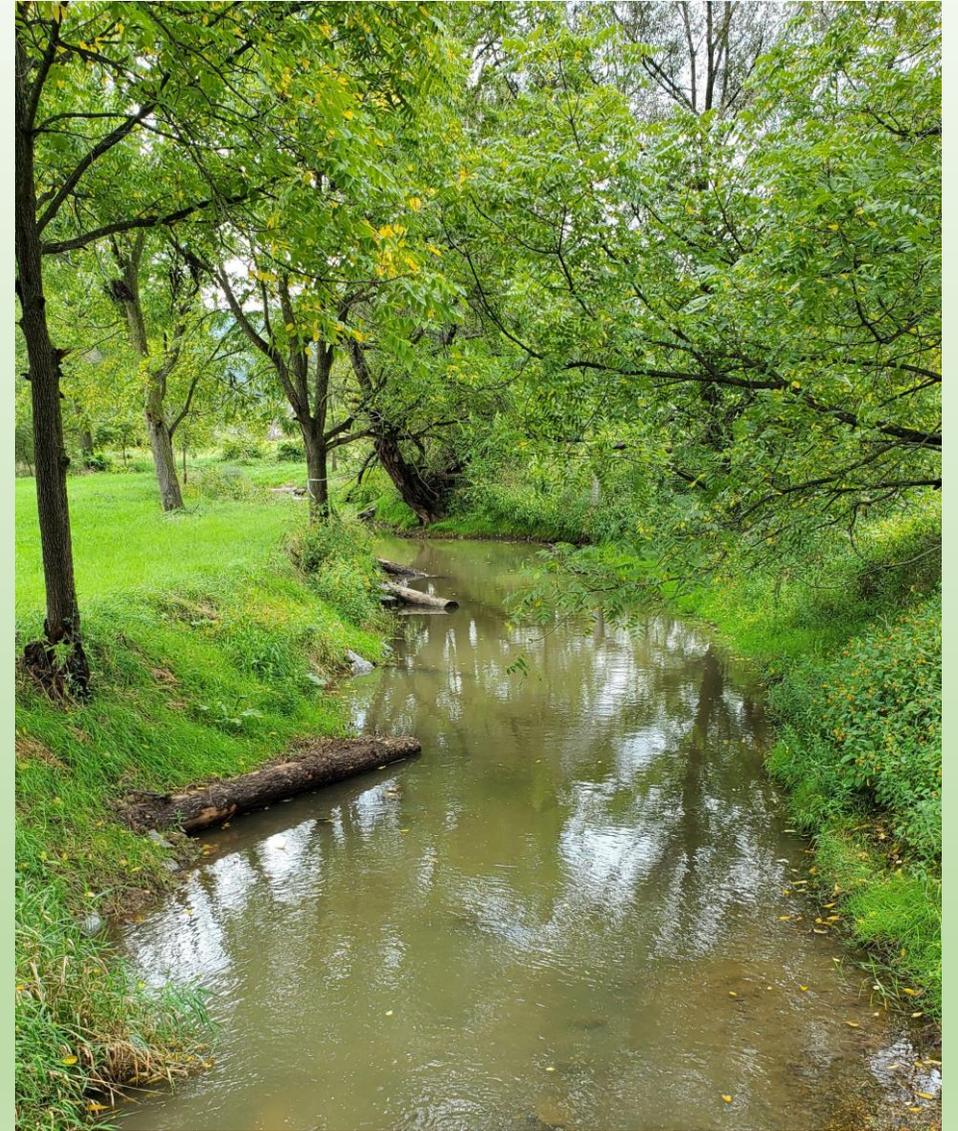


Photo above taken from footbridge, September 8.

This photo was taken August 12, 2022 during a pause in construction activity. The project site was visited to assess the growth of the grass that had been seeded. This image is included here as the only photo that shows the log stockpile at far right in the background.



# Construction

Also constructed in the first days of August, just below the series of vanes and deflectors, was a larger modified mud-sill spanning an outside bend of the northwestern bank. This was one of the most significantly eroded areas.



The photos here are from January 2020 and the fallen tree seen in the photo at right was removed prior to work commencing in 2022.

Just below the site in these photos, the creek made a reverse meander where erosion exposed another undercut began, though less severe.

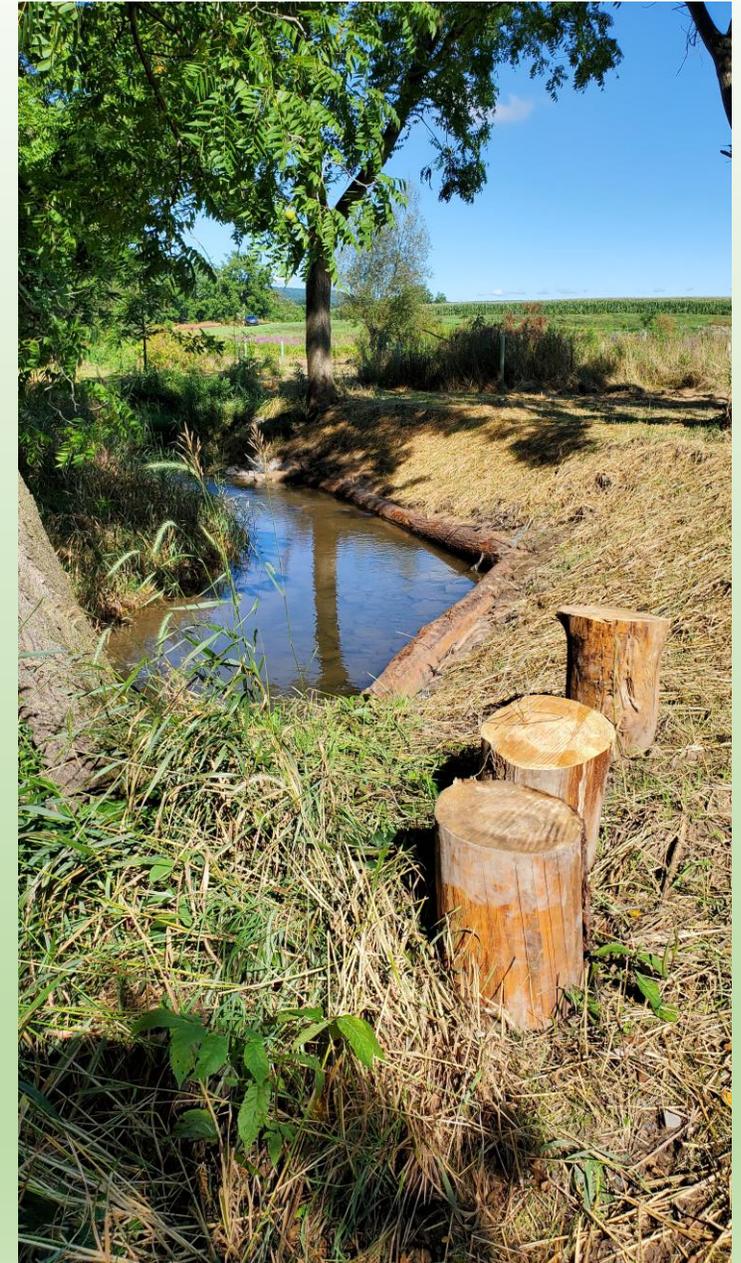
# Construction

After the tree in the preceding photos fell, bank erosion widened the stream considerably and exposed a mid-channel bar of stone that previously form the toe of the former streambank. When the modified mud-sill seen in these images was installed, the face logs were situated to approximate the location of that previous bank toe.



# Construction

Erosion was occurring on most of the meanders proceeding downstream. Modified mud-sills, often with wing-logs, were installed to stabilize the stream banks.



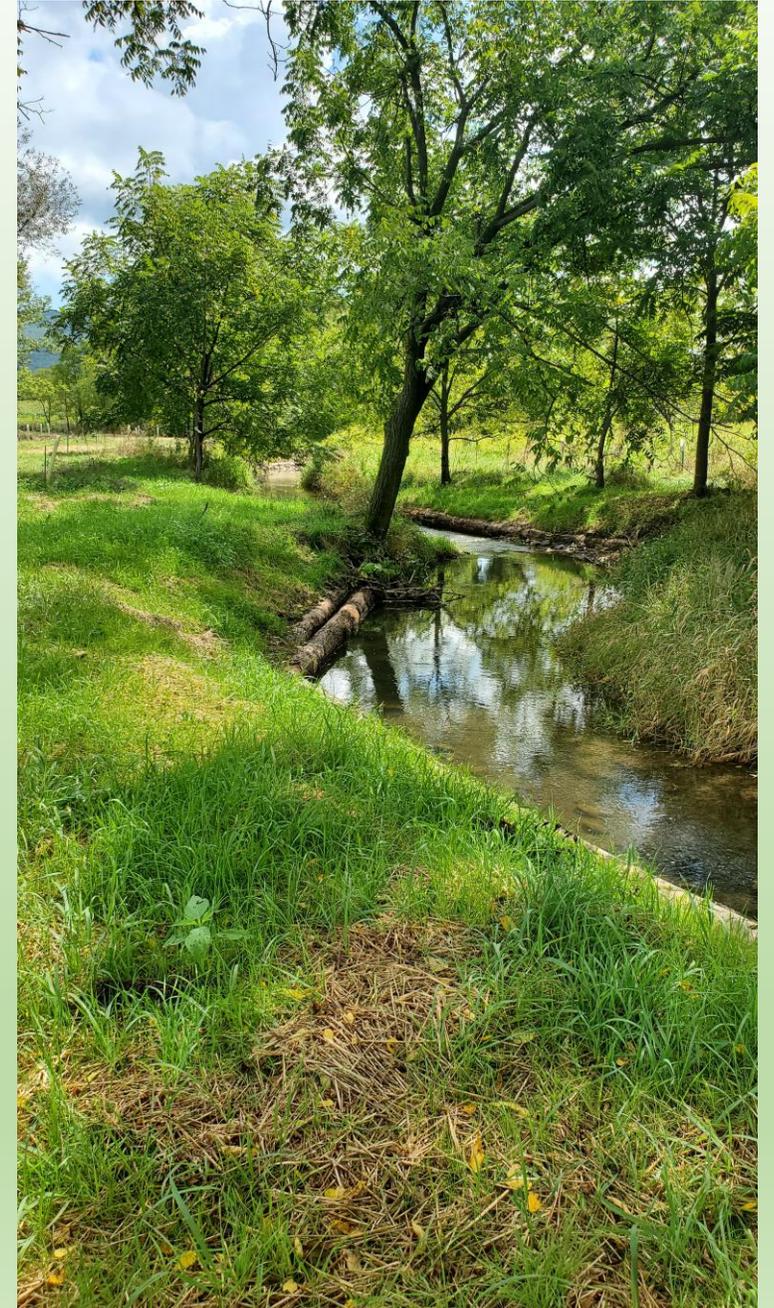
# Construction

At another location on the stream the channel was narrow where it entered a small, deeper pool that was significantly wider and slower. Exiting the pool, the channel again narrowed as it flowed over a riffle area. An eroded bank, partially hidden by the small walnut tree on the right of the photo below was addressed with a log-framed rock deflector, while a pair of opposing log vanes at the head of the pool were installed to center the flow and flush sediment through the mid-channel. The photo at right shows this pool in the background.



# Construction

The photo below is the same pool from the previous slide but about two weeks later showing the grass well established in the seeded/mulched areas. The deflector is seen in upper left and the two vanes are viewed from different angle. The photo at right shows the downstream section below the pool with the grass reestablished.



# Construction

This panorama view of the last larger eroded site to be stabilized with a multi-section modified mud-sill was created in Photoshop by merging multiple photos. It is a distorted view in that what appears to be a straight section of stream is really a sweeping bend with an eroding outside bank.



Similarly, the photo below is a multi-shot composite showing the logs comprising a 2 section modified mud-sill with wing logs both upstream and downstream. Double sill logs are visible in three of the trenches.



This photo shows the streambank at the far left of the composite views on previous slide. It was inserted here to show the nature of the streambank in most areas worked; much harder to spot eroding banks than in January.



# Construction

These are some of the photos used in the lower composite panorama in a previous slide, providing clearer view of the sill logs.



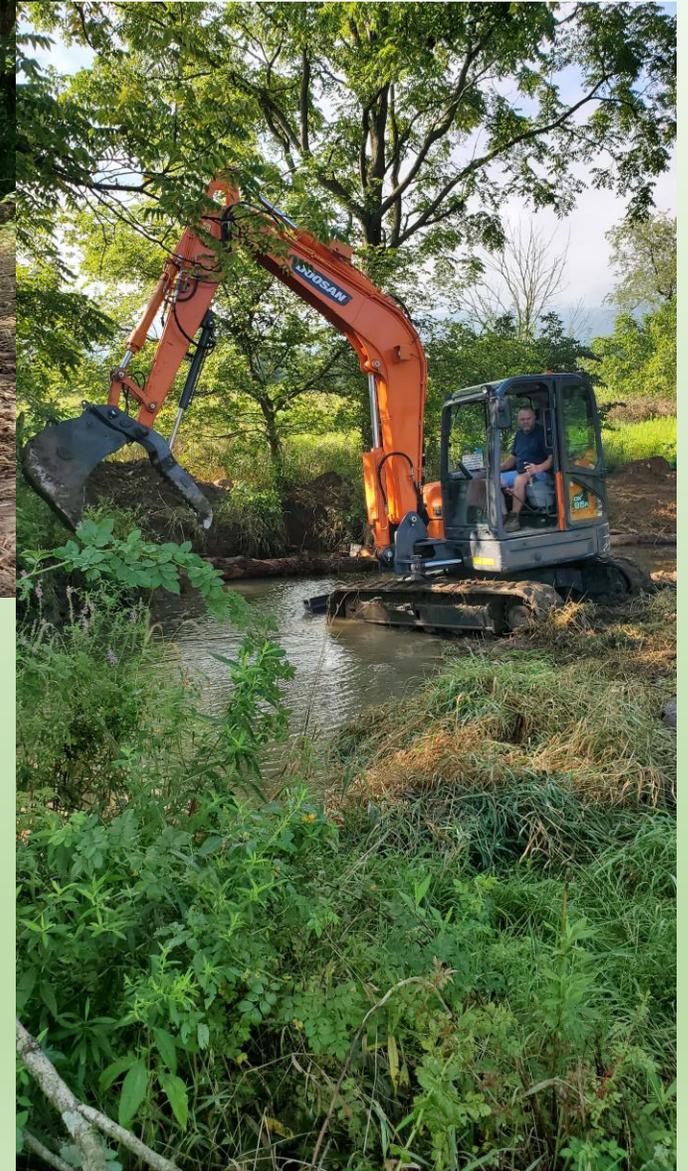
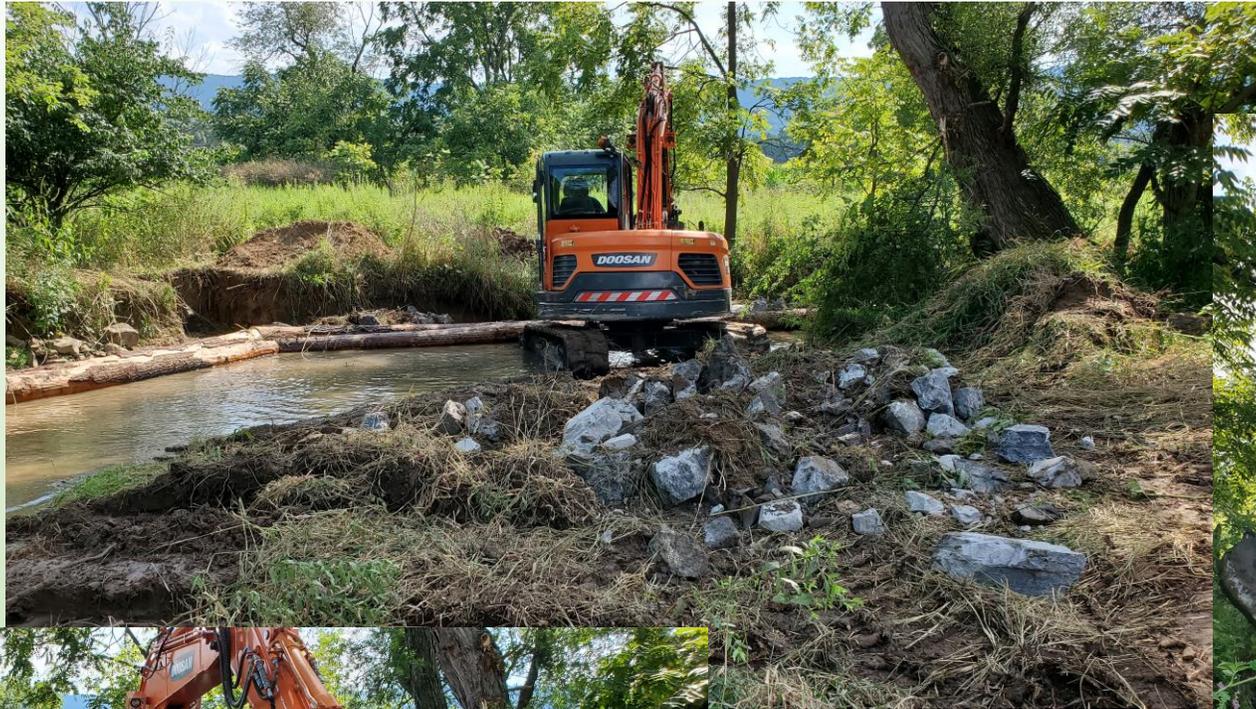
# Construction

Again, closer views of log assemblage for modified mud-sill.



# Construction

Here the contractor begins placing rock in sill log trenches and behind face logs to stabilize log structure and rebuild bank.



# Construction

When rock fill is completed, the contractor does a nice job in replacing excavated soil and native stone over the limestone rip-rap, carefully tamping each lift of soil in preparation for seeding and mulching. These areas will also be planted with native trees and shrubs in the spring of 2023 to further restore the riparian buffer area.

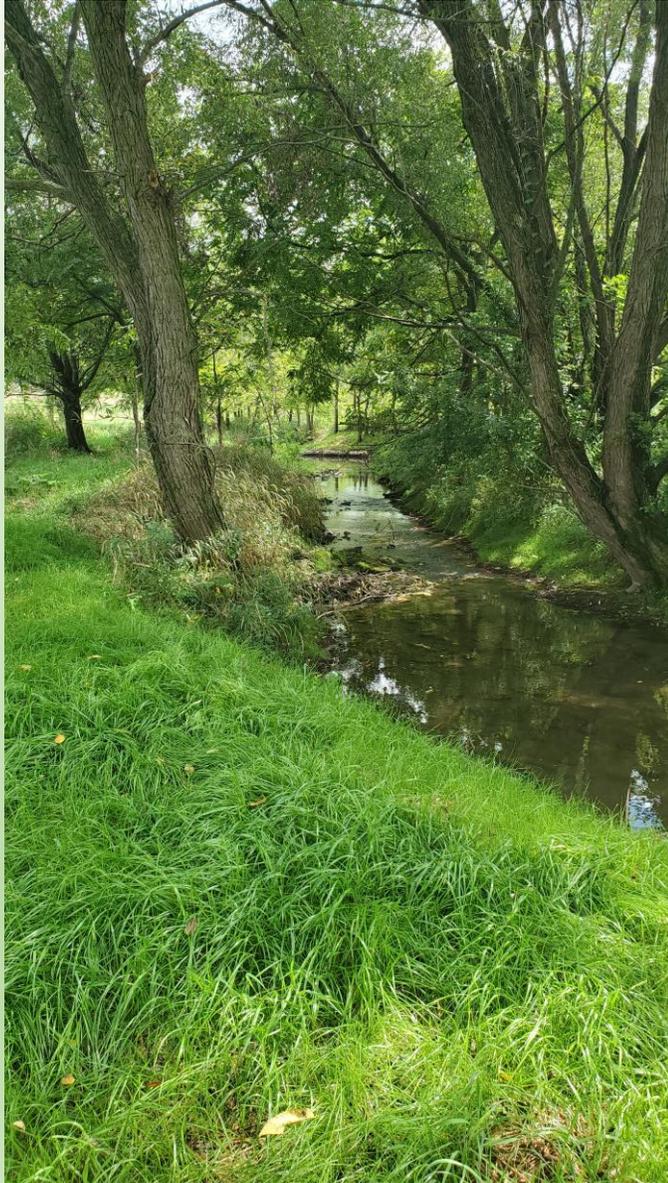


# Post-Construction

Photo below to illustrate the growth of the planted grass and the 'park-like' nature of the restored areas. On the right is a view in the direction opposite of the stream showing some of riparian buffer adjacent fields and neighboring farms.



# Post-Construction



More pretty pictures

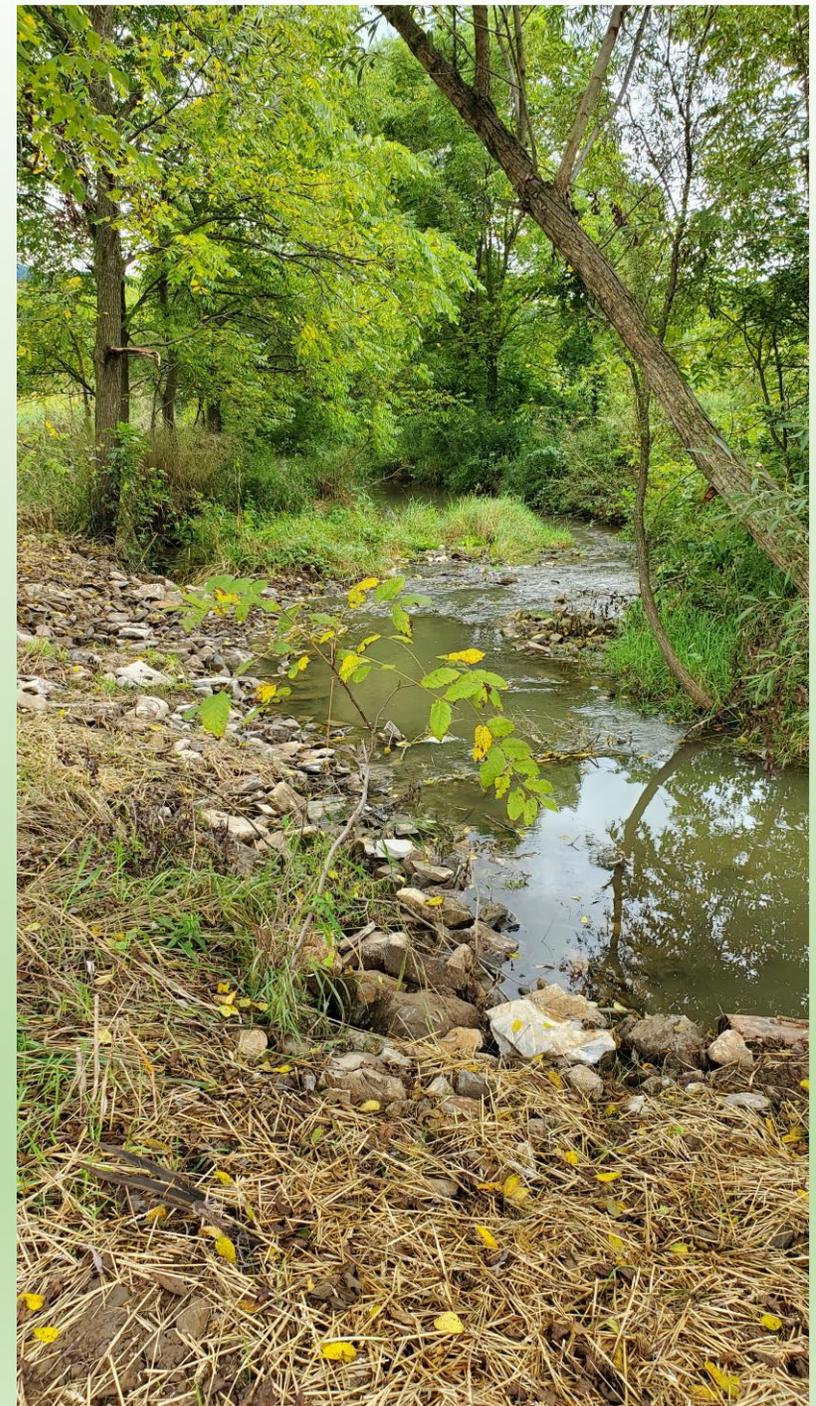
# Post-Construction

The last big mud-sill with grass just beginning to show.



# Post-Construction

The small mud-sill near the property line and the look around the corner



# Post-Construction

Different views of the last slide subject



# Post-Construction

