

**Monocacy Creek Chapter of Trout Unlimited
Monocacy Creek Dam Removal and Stream Restoration Project
Coldwater Conservation Grant Final Report**

- **Before and after photos of the project site(s)**



Before project: the dam on Monocacy Creek obstructing flow and degrading habitat.



After project: immediately after dam removal in July 2016. A nice riffle now exists where the dam stood and the stream begins to narrow.



After project: Former dam site in October 2016. More of the sediment has been cleared from the stream bottom, the newly exposed banks have begun to revegetate and the planted shrubs and trees help to continue stabilizing the banks.

- **Project summary**

The Monocacy Creek Chapter of Trout Unlimited (TU) worked with Wildlands Conservancy to restore a degraded section of Monocacy Creek in Northampton County. Monocacy Creek is a High Quality Coldwater Fishery and a Class A wild trout stream but a concrete run-of-the-river dam was degrading habitat and obscuring fish passage. The dam was identified as a prime candidate for removal as it no longer served a purpose in the stream. It was instead exacerbating flooding and erosion issues on the adjacent properties, blanketing the stream substrate with sediment, and degrading water quality by increasing temperature and decreasing dissolved oxygen in the impoundment behind the dam. Macroinvertebrate sampling completed before the dam removal found that the impoundment behind the dam was dominated by pollution tolerant species as well as species normally associated with stagnant ponds. The area was further degraded by eroded banks that disconnected the stream from its floodplain and lack of a significant riparian buffer. We determined that removing the dam and restoring the streambanks would provide significant benefits for aquatic and terrestrial species.

TU began reaching out to the landowners on both sides of the stream who were the owners of the dam. After educating them about the hazards and drawbacks of dams, as well as the benefits of removal, both landowners agreed to move forward with stream restoration. TU brought in Wildlands as a partner on the project to help with dam removal design and project management. Wildlands completed the design and permitting for the dam removal and we worked with the appropriate agencies to obtain permission for the project. Once the grant funding came through, we were able to move forward with project planning and implementation. We continued to work with the landowners on every step of the project and hired a contractor to remove the dam. Once a construction date was set, we worked with the contractor to ensure they understood the design plans and implemented the proper erosion and sediment control measures.



We removed the dam and stabilized the streambanks in July, and began seeing immediate benefits. The unnaturally wide and shallow channel created by the dam began to narrow as the impoundment drained. The stream was restored to free-flowing conditions for the first time in

almost 100 years. A few months later, the stream substrate is significantly more exposed as the sediment buildup has begun to clear. More of the bank is exposed and has begun to revegetate now that it is stable. During the first significant rain event following the dam removal, the adjacent properties did not experience any flooding. In the past, the stream would flood well into both properties. A nice riffle now exists where the dam used to be.

We held a planting event in early October to install a native riparian buffer along both sides of the stream. Early on, we identified this as an opportunity for volunteers to get involved and invested in the project. Approximately 25 people came out to help us plant 50 trees and shrubs along the streambanks. Most volunteers came from local watershed groups that are invested in the health of the Monocacy watershed. We had a very successful volunteer event and the stream and riparian buffer now provide significant wildlife habitat and water quality benefits.

- **Project outcomes**

- a. Were all project objectives met?**
- b. If not, which ones and why not?**
- c. Is project considered complete? If not, what remains to be accomplished?**

All project objectives laid out in the grant agreement were met. We completed the design and permitting for the project, conducted outreach to the landowners and local community, successfully removed the dam and stabilized the stream banks,



and planted a native riparian buffer along both streambanks. The project is complete now that the stream is restored to free-flowing conditions. The stream channel will continue to adjust to the removal of the dam. The stream conditions and water quality will continue to improve as the remaining sediment is flushed from the stream bottom, and the native riparian buffer continues to grow and provide habitat and shade. The final piece of the project will be completed by mid-November. We will be installing no-mow signs along the edge of the planted trees and shrubs to further protect them and prevent the landowner from mowing the other vegetation that will grow up. Once the signs are installed, the project will be complete.

- **Project sustainability**
 - a. **Discuss the long term sustainability of the project as implemented. What are potential threats to sustainability?**
 - b. **Monitoring, operation and maintenance plans.**

One advantage of dam removal is the long-term sustainability. Once the dam is removed, there are immediate and lasting benefits, as well as further improvements that come over time. There is no real threat to the sustainability of the instream benefits since the obstruction has been completely removed. The channel will continue to change and water quality will keep improving as the stream becomes more naturalized. As conditions continue to improve, native aquatic species will begin to recolonize the area. The only potential threat to sustainability lies in the riparian buffer and floodplain area. We have no regulatory power to force the landowners to continue implementing best management practices in streamside care.

However, a significant portion of this project involved outreach to both landowners. We worked closely with them on the design and implementation of the project. Both were initially somewhat reluctant to stop mowing and plant trees along the banks, but came around by the end of the project. We spent time to educate them about the benefits for wildlife and the health of the stream, as well as the benefits to their property including reduced erosion and flooding. Both are now excited to see their properties and the stream improve with the new riparian buffer.

No formal operation and maintenance plan was created for this project, but our work with the landowners gave them the tools and the knowledge they need to properly care for the project area. They were instructed to reach out with any questions or concerns in the future and to continue the new management techniques. These types of projects are nice for landowners because the end result actually involves less management and work. They have a smaller area to mow and will no longer have to worry about mitigating impacts from flooding and eroding streambanks.

- **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.**



We are currently looking into the possibility of installing instream habitat structures along the project reach. At this point, the stream channel is still settling and choosing its course, but once that is set, it could be beneficial to continue improving the habitat. Wildlands met with the PA Fish and Boat Commission (PFBC) to discuss several sites that might benefit from a second phase to install instream structures. Bridle Path was included in that list and

The flat, featureless stretch above the former dam does not provide ideal habitat.

PFBC indicated that the site would be further improved by instream structures. The reach that we worked on is fairly straight, wide and shallow with uniform conditions that do not make ideal habitat. Some structures along the banks and in the stream could greatly benefit native species. These structures would create nice pools and encourage riffles and swift-moving sections.

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

- Monocacy Creek Chapter of Trout Unlimited: TU donated a significant amount of in-kind hours towards the projects. We committed time for outreach to landowners, project design and planning, construction oversight and riparian buffer planting. Through involvement with each phase of the project, our in-kind contribution totaled 100 hours.
- Wildlands Conservancy: Wildlands committed in-kind match for the project which included time for dam removal design and permitting, project planning, educational outreach, project management, construction oversight, plant purchase and volunteer event organization. American Rivers and the PA Fish and Boat Commission were involved in early stages of project design and planning. The in-kind contribution from Wildlands, American River and Fish and Boat amounted to \$11,500.
- Monocacy Creek Watershed Association (MCWA): The MCWA was involved in



community outreach throughout the project period and was informed about project progress at monthly meetings. The Board also volunteered during the planting event in October. Through the course of this project, the MCWA contributed 30 in-kind hours. The MCWA Board also made the decision at their September board meeting to contribute \$500 of cash match toward the project to purchase additional plants for the riparian buffer.

- The local community was also involved in the project through our planting event in October. Through their volunteer involvement, local community members contributed 27 in-kind hours to the project.

- **Accomplishments and Outputs**

- a. **Observed or measured improvement to overall condition of the stream or watershed.**

- b. **Riparian buffer projects and natural stream channel projects:**

- i. **Number of linear feet/acres improved? _____ (for buffers remember to account for both stream banks if applicable)**
- ii. **Number of trees planted, if applicable**

iii. Number of structures placed, if applicable

There have already been significant observable benefits to the stream since the dam removal in July. The stream has narrowed now that the dam is no longer impounding water and eroding the surrounding streambanks. The buildup of sediment on the stream substrate has begun to clear and expose the gravel and cobble that is suitable for macroinvertebrate and fish habitat. The downstream scour from the dam has been filled in and a natural riffle has taken the place of the deteriorating concrete dam. As the stream channel has narrowed, new banks have been exposed and stabilized. The newly exposed soil has begun to revegetate which has reconnected the stream to its floodplains.

The dam was impounding water all the way to the bridge 650 ft. upstream, creating slow-moving and sediment-laden water that was unnaturally warm and low in oxygen. With the removal of the dam, the stream and impoundment area were restored to free-flowing conditions. We improved approximately 600 linear feet on the right bank and approximately 200 feet on the left bank by planting a native riparian buffer. These improvements included 50 native trees and shrubs along with 100 native herbaceous plugs to stabilize the banks and provide habitat and food for wildlife.