Eastern Brook Trout Joint Venture
Completed Project Report Form

Project Title: Culvert Replacement and Stream Restoration in Wolfden Run, Garrett County, Maryland

- **Location:** Maryland, Garrett, Kitzmiller
- **Lat / Long Coordinates:** 39.396559, -79.215747
- **Sponsor:** Trout Unlimited Western Maryland Initiative
- **Completion Date:** September, 2020
- **Partners involved:** Maryland Department of Natural Resources, U.S Fish and Wildlife Service, NFWF Chesapeake Bay Stewardship Fund, EBTJV
- **Project costs:**
  1. Total cost: $189,753
  2. Non-federal amount: $65,785
  3. Federal amount: $123,968
- **Final Cash Funding:**
  NFHAP Funding Through EBTJV: $20,550
  Total Federal Contributions: $123,968
  Total Non-Federal Contributions: $57,945

Partner	Type of Contribution (In-Kind or Cash)	Amount
USFWS (EBTJV and NFPP)	Cash	$70,550
National Fish and Wildlife Foundation	Cash	53,418
Maryland Department of Natural Resources	Cash	$57,945
Maryland Department of Natural Resources	In-Kind	$7,840

Wolf Den Aquatic Organism Passage Project NFPP FY20

Western Maryland Initiative

Final Report to

The United States Fish and Wildlife Service

Submitted: October 4th, 2021
Grant # F20AC00208
Period of Performance: March 1st, 2020 and ending June 15th, 2021
Reporting October 1st, 2020- June 15th, 2021

Grantee
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Project Goals:

Wolf Den Run is a direct tributary to the North Branch of Potomac River, Chesapeake Bay drainage with much of the watershed within newly protected state land. The 5 square mile watershed is located just west of Kitzmiller, Maryland and suffers from historic and current anthropogenic stressors related to resource extraction (e.g. excessive timbering and coal mining). Despite this host of impairments, 5 years of Maryland DNR Fishing and Boating Services population surveys have identified a stable eastern brook trout population residing within the stream. Accordingly, Trout Unlimited in collaboration with the U.S. Fish and Wildlife, the National Fish and Wildlife Foundation, MD DNR Fishing and Boating Service, and the Maryland Park Service completed work on public land to reconnect important spawning and foraging habitat for eastern brook trout.

Located on Wolf Den Run, the AOP barrier mitigation project was designed to replace a currently failing road stream crossing. The installation of a bridge was intended to improve recreational opportunities within Wolf Den Run State Park, allowing visitors increased fishing, bird watching, and hiking access. Previous conditions at the road stream crossing prevent access for park goers and for management staff responsible for visitor safety. The replacement bridge will ensure access while reconnecting 2.8 miles of headwater habitat.

Completed - Aquatic Organism Passage Barrier- Perched Culvert Removal and Replacement-

In June of 2020, TU successfully procured a construction contractor, Carl Belt Inc. of Cumberland, MD, to remove the existing structure and replace it with a prefabricated bridge manufactured by ADM Welding. USFWS Partners for Fish and Wildlife provided technical assistance to MD DNR engineering staff who was the lead designer on the project. Collaborative efforts ensured construction designs adequately spanned the stream and allowed for natural stream process/fish movement. At the MD DNR's request for third party stamping, TU's procurement involved Carl Belt's subcontracting of Bennett, Brewer and Associates of Frostburg, MD to stamp the final designs. The prefabricated bridge/concrete abutments were installed in August and September of 2020 with construction completed on 9/8/2020. All necessary permits were in place prior to construction.

Project Photos:

Before:

After:

Completed - Informational Sign Installation:

Trout Unlimited in partnership with the Maryland DNR Park Service created an informational sign detailing the mobile life history strategy employed by Eastern brook trout. The sign highlighted the value of fish friendly road infrastructure in promoting aquatic organism passage. Project partners NFWF and the USFWS were provided an opportunity to review sign content and offered their authorization to proceed with its construction.

Completed - Project Monitoring:

Fisheries Monitoring –
In 2020, Trout Unlimited, alongside MD DNR Fishing and Boating Service staff, have collected baseline fish community data above and below the structure. Brook trout were not detected during quantitative sampling efforts upstream or downstream of the to be replaced culvert priori to construction. Further qualitative sampling efforts verified that brook trout do not appear to be present currently within the reach.

To diagnose the cause of brook trout absence, TU extended visual searches for movement barriers downstream into an area that was previously inaccessible (private property) when original culvert surveys were completed. Additional searching for stream blockages revealed an abandoned and previously unknown concrete and stone dam downstream. The dam represents a clear AOP barrier as the dam's concrete base was constructed atop bedrock, creating fast, shallow conditions just downstream of the relic impoundment (see photo below). Due to the shallow staging area, it is unlikely that brook trout can easily overcome the vertical drop. TU enlisted MDDNR staff to conduct qualitative fisheries samples upstream and downstream of the abandoned dam. Brook trout were found in abundance below the dam with only one individual observed upstream.

In 2021, post-implementation fisheries sampling was also conducted upstream and downstream of the replaced structure. As in 2020, brook trout were not detected in each of the two sampling reaches (upstream or downstream of the former blockage). Additional qualitative sampling was conducted downstream of the above-described remnant dam. Both adult and young of year brook trout were detected to the base of the dam. No brook trout were detected in pool habitat immediately upstream of the dam.

pH Monitoring -

In 2020, TU also deployed continuous pH loggers upstream of the to be replaced structure and below the newly discovered impoundment. Wolf Den Run is known to experience reduced water quality stemming from upstream acid mine drainage. However, as mentioned above, ongoing fisheries monitoring indicates stable brook trout populations at several downstream monitoring stations. The purpose of pH logger deployment was to determine whether low pH thresholds are exceeded in upstream reaches above the replacement culvert but through dilution in a downstream direction are not exceeded where brook trout have been commonly observed. The data revealed nearly identical minimum and maximum pH values above the to be replaced culvert and below the newly discovered dam, suggesting that pH is not the limiting factor. Personal communication with MD DNR staff indicates that water quality in Wolf Den Run was considerably poorer in previous decades when mining was more active. Consequently, brook trout populations may have been extirpated from upstream reaches. One possible explanation for the absence of brook trout is that, following water quality improvements, brook trout were unable to effectively recolonize areas upstream due to the presence of the newly discovered dam.

Because the dam appears to be playing significant role in limiting upstream recolonization, TU is currently working to obtain additional funding through the National Fish Passage Program (NFPP) for the removal of the abandoned structure. In support of the project, TU has secured assistance from MD DNR for survey and design and plans to submit a 2022 application for NFPP funds.

Newly discovered dam –

Conclusion:

Despite the discovery of an additional barrier limiting brook trout movements in Wolf Den Run, TU views the fully completed project as a success. The passage barrier was effectively removed at the project location. The current structure is now in use and allows park visitors access as intended. TU is now aware of the additional barrier and is taking active steps to address additional resource concerns in the watershed.

As TU Western Maryland Initiative's first AOP project in Maryland, the project solidified working partnerships with engineering staff in the Maryland Department of Natural Resources. Through effective collaboration on the Wolf Den Run project, TU and MDDNR engineers are now partnering toward a) the replacement of a failing culvert within the Savage River State Forest on a tributary to Blue Lick Run, and b) the removal of the newly discovered impoundment on Wolf Den Run. The successful partnership is expanding TU's capacity to implement AOP projects in Western Maryland. This is evidenced by TU's successful award of additional 2021 NFPP funds for the above-mentioned culvert replacement on Blue Lick Run. MDDNR is taking lead role in engineering on this second project.