



Culvert Assessment and Prioritization of Upper Moshannon Creek Centre and Clearfield Counties, PA

Addendum to the 2020 Coldwater Conservation Plan for the Moshannon Creek Watershed in Central Pennsylvania

November 2023

Background

In 2022, a Coldwater Heritage Partnership Implementation grant was awarded to the Clearfield County Conservation District (CCCD) with Trout Unlimited (TU) as a contracted partner. The goal of this project was to identify culverts that are barriers to aquatic organism passage and prioritize culverts for potential removal or replacement in the Moshannon Creek watershed. From the new culvert data collected, TU's Eastern Brook Trout Conservation Portfolio was updated to reflect any newly identified culvert barriers in Moshannon Creek to aid with prioritization of culvert barriers for removal or replacement. Another goal of the project was to identify any previously unassessed streams in the watershed under the PA Fish and Boat Commission's (PFBC) Unassessed Waters Initiative (UWI) to locate previously unknown populations of trout. While many miles of trout streams have previously been identified, some tributaries remained unassessed throughout the watershed. CCCD has assisted TU for over a decade as a partner in the PFBC UWI. We worked in collaboration with PFBC to prioritize the remaining unassessed waters in the watershed and completed 11 surveys on previously unassessed stream segments. Documenting the presence of wild trout in the watershed and the physical barriers that may be isolating populations will provide a better understanding of the status of brook trout in the watershed and will help guide future conservation efforts.

The Moshannon Creek watershed drains an area of 275 square miles, the creek is the boundary between Clearfield County to the northwest and Centre County to the southeast for much of its length. The creek flows northeast until joining the West Branch Susquehanna River upstream of the village of Karthaus where it stains the river red with precipitated iron from abandoned coal and clay mines. Much research has been done to characterize and identify the, often complex, influences from the mine pools and associated AMD in the watershed. Work is continuing by the CCCD and other partners to quantify impacts of AMD in the upper watershed and complete conceptual design for passive treatment systems to restore water quality in the watershed.

While the AMD impacts remain the primary focus of restoration efforts in Moshannon Creek, many miles of naturally reproducing wild trout waters (WT) also exist within the watershed. Currently there are 134.5 miles of naturally reproducing wild trout streams within the watershed as listed by PFBC. Many of those miles (52.9 miles) are Class A populations. These streams are crisscrossed by roads, railroads, driveways, and trails often resulting in fragmented trout populations due to culverts presenting barriers to movement within the system. Fragmentation of aquatic ecosystems leads to lack of genetic diversity in a trout population making it more susceptible to disease, less resilient to the changing climate, and less likely to adapt to changing ecological conditions and other stressors. In addition to genetic isolation, physical limitations posed by AOP barriers prevent trout from migrating upstream to complete their spawning cycle, escape predation, avoid competition, seek coldwater refugia in warm months, and find food.

Methods

Unassessed Waters Surveys

TU staff attends annual trainings with PFBC to stay current in our partnership with the UWI. A designated list of potential fishery survey locations is provided by PFBC staff and only those streams may be surveyed by TU for this initiative. All data were collected following the PFBC UWI Survey Protocol and have been submitted to PFBC for their data records.

Fisheries data were collected using battery powered backpack electrofishing gear using pulsed direct current. A Smith-Root model LR-24 backpack electrofisher was used for each of the surveys. Electrofishing proceeded straight upstream from the beginning of each sample site. All fish observed by the field crew were identified in the field and a subjective abundance rating was assigned to each species based on the PFBC unassessed waters protocol (PFBC 2019).

Salmonids (trout) were collected and held during electrofishing surveys and measured to the nearest millimeter (total length). Each individual trout was then assigned to a 25mm size class. All fish were released unharmed following processing.

Water chemistry was collected in the field. Parameters measured and recorded included: time of day, water temperature (°C), pH (standard units), total alkalinity (mg/L), and specific conductance (µmhos). All equipment was properly calibrated and EPA protocols were followed.

Crossing Assessments

The North Atlantic Aquatic Connectivity Collaborative (NAACC) is a network of individuals from universities, conservation organizations, and state and federal natural resource and transportation departments focused on improving aquatic connectivity across a thirteen-state region, from Maine to Virginia. The NAACC has developed protocols (Abbott and Jackson 2019; <https://streamcontinuity.org/naacc>) for assessing road-stream crossings (culverts and bridges) and developed a regional database (NAACC 2023; <https://naacc.org>) for these data. The information collected aid in the identification of high priority bridges and culverts for upgrade and/or replacement.

Assessments were overseen or completed by Lead Observers, or more highly certified field staff,

certified by NAACC. General information was collected at each site including; latitude and longitude, road name, township name, date surveyed, name of certified field staff, stream name, road type, crossing type, crossing material, and number of cells. Road-stream crossing assessments consist of physical measurements of crossing dimensions, photos of the crossing, stream channel up- and down-stream of crossing, and observations of crossing and stream conditions. Assessments were completed using either paper field forms or digital PDF forms completed on electronic devices. Measurements were taken using stadia rods and surveyors' tape and were recorded in tenths of feet.

Measurements consisted of inlet/outlet dimensions, length of crossing, water depth at the inlet/outlet, and roadfill height (if roadfill is present). Additional observations include a visual assessment of the alignment of the structure relative to the stream channel, general crossing condition, type of inlet/outlet grade (i.e. perched, inlet drop, outlet freefall, at stream grade, etc.), flow condition (i.e. dry, typical low-flow, moderate flow, etc.), size of tail water scour pool, structure substrate type and percent coverage, and comparison of water depth and velocity relative to natural stream conditions. Other information that can be collected, but is not required in order to calculate aquatic passability includes slope of structure using an inclinometer and bankfull measurements. Bankfull measurements were taken in undisturbed stream reaches out of the range of influence of the structure.

Assessments are saved on electronic devices or digitized from paper forms after surveys are completed. Assessment forms were uploaded to the NAACC database and GPS locations were matched to existing crossings identified by GIS analysis or assigned to a new crossing if one was not recognized by the GIS analysis. Once forms are uploaded they must be approved by L1 or higher certified staff to be finalized. Once assessments are uploaded and approved, passability scores are calculated and posted to the online database. Survey information and calculated passability scores can be viewed at www.NAACC.org

Sub-watershed Prioritization

Initial GIS analysis identified over 450 unsurveyed crossings in the Moshannon Creek watershed. Sub-watershed prioritization was completed to ensure culvert assessments were done on crossings with the most potential for ecological restoration and reconnection of existing trout populations. Sub watersheds were analyzed and ranked based on parameters such as number of wild trout miles, number of class A trout miles, as well as where remediation efforts are underway and/or focused.

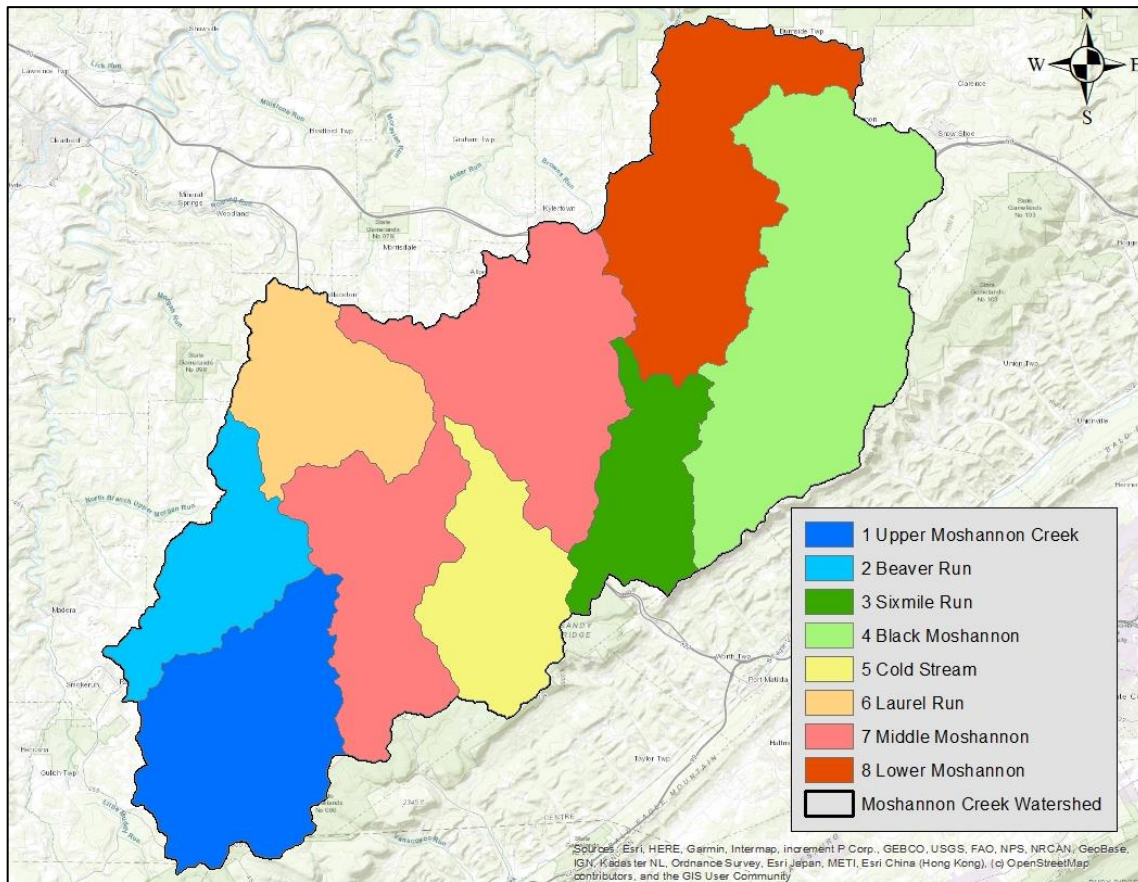


Figure 1. Moshannon Creek watershed sub-watershed culvert prioritization map. The numbers next to each sub-watershed in the map legend denote the priority for assessments, with 1 being the highest priority.

Portfolio Update and Culvert Prioritization

We used a Conservation Portfolio approach for evaluating potential culvert barriers for replacement or removal throughout the Moshannon Creek watershed. This approach has been used previously to develop an Eastern Brook Trout Conservation Portfolio and Range-wide Analysis for the eastern range of the brook trout (Fesenmyer et al., 2017). The detailed report for this project and associated web-based tools may be accessed at:

<https://www.tu.org/science/conservation-planning-and-assessment/conservation-portfolio/eastern-brook-trout-conservation-portfolio/>. These methods were adapted to the smaller geographic scale of the Moshannon Creek watershed and additional, local datasets were included in the analysis for Moshannon Creek.

Similar to the large-scale analysis, the foundational unit of the analysis is the habitat patch. Habitat patches for the Moshannon Creek geography were delineated by aggregating the small catchments that contribute to individual stream segments known to support trout. Since new barrier assessments were for this project, the conservation portfolio patches were updated for the

watershed to reflect the new barrier assessments (See section on Aquatic Organism Passage Prioritization in the Methods), these data were used to fragment patches. Additionally, each patch was attributed with the following information:

- Patch characteristics such as area and stream length from the U.S. Geological Survey National Hydrography Dataset (USGS 2020).
- Average trout species biomass and density from PFBC. This information is used to estimate the brook trout population for each patch and summarize the miles of stream meeting PFBC biomass classification standards. Additionally, we summarize the mileage of streams currently designated as Class A by PFBC (July 2019 data; PFBC 2019).
- Barrier information using field surveys submitted to NAACC, as well as an information about the upstream and downstream limits to fish distribution.

The smallest habitat patch unit is a catchment obtained from the NHD Medium Resolution catchment layer, therefore in some cases some culvert barriers may appear to show up in the middle of a patch. Due to catchment being the smallest unit, some of these patches were unable to be divided further.

For Moshannon Creek, the Portfolio considers those habitat patches which support at least 2,500 brook trout as *stronghold populations*. Allopatric brook trout habitat patches which have between 500 and 2,500 individuals or sympatric trout habitat patches with between 1,500 and 2,500 brook trout are considered *persistent populations*. All other populations are categorized as *other populations*.

Each road-stream crossing in the Moshannon Creek watershed was assessed according to protocols established by NAACC as previously described. Assessment protocols are detailed in Abbott and Jackson (2019). A total of 173 road-stream crossings were assessed as part of this project (Figure 4 in results). All data from those assessments are publicly available from the NAACC database.

Road-stream crossings were prioritized by using three broad categories with multiple parameters (Table 1). Information on NAACC coarse screen and numeric scoring system are available in Appendix A. NAACC coarse screen parameters were assigned numerical categories for the analysis according to Tables 2 and 3. Only culverts that scored as ‘No AOP’, ‘Reduced AOP’, or if a culvert only had one NAACC score (Coarse Screen or Numeric) were considered for prioritization. The community parameter for the “Fishery” category was derived based on trout community present in both the upstream and downstream patch adjacent to each crossing. The scoring matrix for the community parameter is detailed in Table 4. The highest scores were assigned to crossings that would connect allopatric populations to other allopatric populations and allopatric populations to patches with no trout present. Likewise, the population parameter for the “Fishery” category was based upon a scoring matrix for the average density of trout (number per km) of trout in both the upstream and downstream patch adjacent to each crossing (Table 5). The highest scores were assigned to crossings that would connect patches with

moderate trout densities. Finally, the amount of connected habitat (km of stream) that would be made available upstream of each crossing was calculated using geographic information systems (GIS).

Table 1. Categories and parameters used in the development of prioritization categories for road-stream crossings.

Category	Parameter(s)	Range	Weight
Culvert Score			0.375
	NAACC Coarse Screen	1–5	0.50
	NAACC Numeric Scoring System	0 - 1	0.50
Fishery			0.375
	Community	0–5	0.50
	Population	0–5	0.50
Habitat			0.25
	Available Upstream Habitat (km)	0 – 30.856	1.0

Table 2. Numerical categories assigned to NAACC coarse screen score categories.

NAACC Coarse Screen Category	Numerical Category Assigned
No AOP	5
Reduced AOP	3
Full AOP	1

Table 3: Numerical categories assigned to NAACC numeric scoring system for aquatic passability.

NAACC Category	NAACC Numeric Score	Assigned Category
No Barrier	1.0	0
Insignificant Barrier	0.80 – 0.99	1
Minor Barrier	0.60 – 0.79	2
Moderate Barrier	0.40 – 0.59	3
Significant Barrier	0.20 – 0.39	4
Severe Barrier	0.00 – 0.19	5

Table 4. Scoring matrix for the community parameter of the Fishery category. Each crossing was assigned the value from this matrix depending upon the trout community present in the upstream and downstream patch that the crossing would connect.

		Upstream Patch Trout Community			
		Allopatric	Sympatric	No Trout Present	Missing Data
Downstream Patch Trout Community	Allopatric	5	1	5	0
	Sympatric	1	3	3	0
	No Trout Present	5	3	0	0
	Missing Data	0	0	0	0

Table 5. Scoring matrix for the population parameter of the Fishery category. Each crossing was assigned the value shown based on the average density (number per km) of trout in the upstream and downstream patch that the crossing would connect.

		Upstream Average Population Density			
		>2,500	1,000 – 2,500	<1,000	Missing Data
Downstream Average Population Density (number per km)	>2,500	2	3	4	0
	1,000 – 2,500	3	5	5	0
	<1,000	4	5	1	0
	Missing Data	0	0	0	0

For each crossing, a standardized parameter score was obtained using the following formula for each parameter in Table 1:

$$\text{Parameter Score} = (\text{Observed Value} - \text{Minimum Value}) / (\text{Maximum Value} - \text{Minimum Value})$$

The parameter scores were then used to calculate a standardized Category Score for each of the three categories using the following formula:

$$\text{Category Score} = (P_1 * wt) + (P_2 * wt) + \dots; \text{ where } P_i \text{ is the parameter score for each parameter within the category and } wt \text{ is the weight assigned to that parameter (Table 1).}$$

Finally, a prioritization score was calculated based on the category scores and the assigned weight of each category:

$$\text{Prioritization Score} = (C_1 * wt) + (C_2 * wt) + (C_3 * wt); \text{ where } C_i \text{ is the category score from above and } wt \text{ is the weight assigned to the category (Table 1).}$$

Prioritization scores for crossings assigned to be culverts ranged from 0.04 – 0.77. The prioritization scores were used to categorize each crossing into 4 categories (Table 6). Appendix B includes the final calculated prioritization scores for culverts assessed during this project.

Table 6: AOP priority categories based on prioritization scores from data analysis.

Prioritization Score Range	AOP Priority Category
0.61-0.77	Very High
0.41-0.6	High
0.21-0.4	Medium
0.04-0.2	Low

Results

Fishery Surveys

A total of 11 unassessed waters surveys were completed, of those 5 had trout present. Three were solely brook trout and the remaining two were sympatric brook and brown trout. All sites with trout qualified for a wild trout listing for brook trout, and one of the sympatric streams qualified for both brook and brown trout. One of the brook trout only streams preliminarily qualified as Class A. The PFBC will make the final determinations if these sites will be added to the wild trout or Class A lists. To date, none of the surveys have been added to either the wild trout or Class A lists.

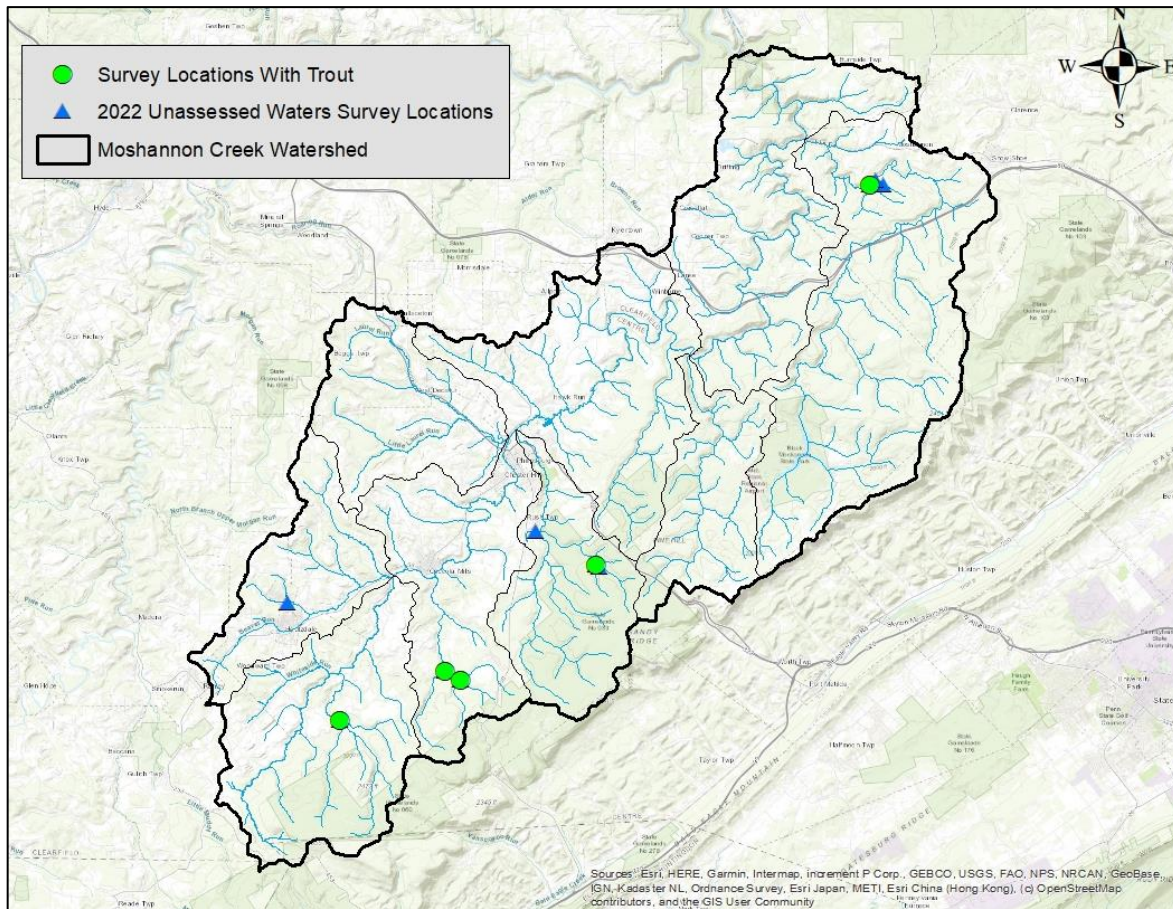


Figure 2. Survey locations of 2022 Unassessed Waters Surveys in the Moshannon Creek watershed.

Table 7. 2022 unassessed waters survey locations in the Moshannon Creek Watershed.

Stream Name	Tributary To	Latitude	Longitude	Dry	Brook Trout	Brown Trout
Trib 25837	Tomtit Run	40.85299	-78.17593		X	
Trib 25872	Trout Run	40.80695	-78.26136		X	X
Trib 25838	Tomtit Run	40.85218	-78.17393	X		
Trib 25840	Cold Stream	40.86675	-78.2085			
Trib 25713	Black Moshannon	41.01678	-78.02022		X	X
Trib 25714 Site 2	Black Moshannon	41.01888	-78.01698			
Trib 25714 Site 1	Black Moshannon	41.01888	-78.01698			
Trib 25873	Trout Run	41.80404	-78.25519		X	
Trib 25874	Trout Run	40.80416	-78.25447	X		
Trib 25884	Goss Run	40.83669	-78.34882			
Trib 25890	Mountain Branch	40.7857	-78.32096		X	

Table 8. Size class distribution of all trout documented throughout 2022 UWI surveys.

Size Classes (mm)	25837	2587	25890	25872		25713	
	BK	BK	BK	BK	BN	BK	BN
25-49							
50-74	5	4	17	2		11	1
75-99		3	1	3		1	
100-124							
125-149			1				
150-174		1	1				
175-199		1			2		
200-224							
225-249				1			
250-274					1		
275-299							
300-324							
≥ 325					1		
TOTAL	5	9	20	6	4	12	1

Crossing Assessments

Initial GIS analysis identified >450 potential road stream crossings that had yet to be assessed in the Moshannon Creek HUC10 (Figure 3). A total of 173 NAACC surveys were completed for this project. Of those, 31 were full barriers, 71 were partial barriers, 61 were full AOP, and 10 could not have a score calculated. A handful of crossings (19 total) were previously assessed prior to this project and had prioritization scores calculated for them. Additionally, there were found to be 13 bridge adequate crossings, and 14 were points where no crossing existed in the field (not included in the total count of NAACC surveys). Appendix C shows NAACC scoring data for all of the crossings assessed during this project.

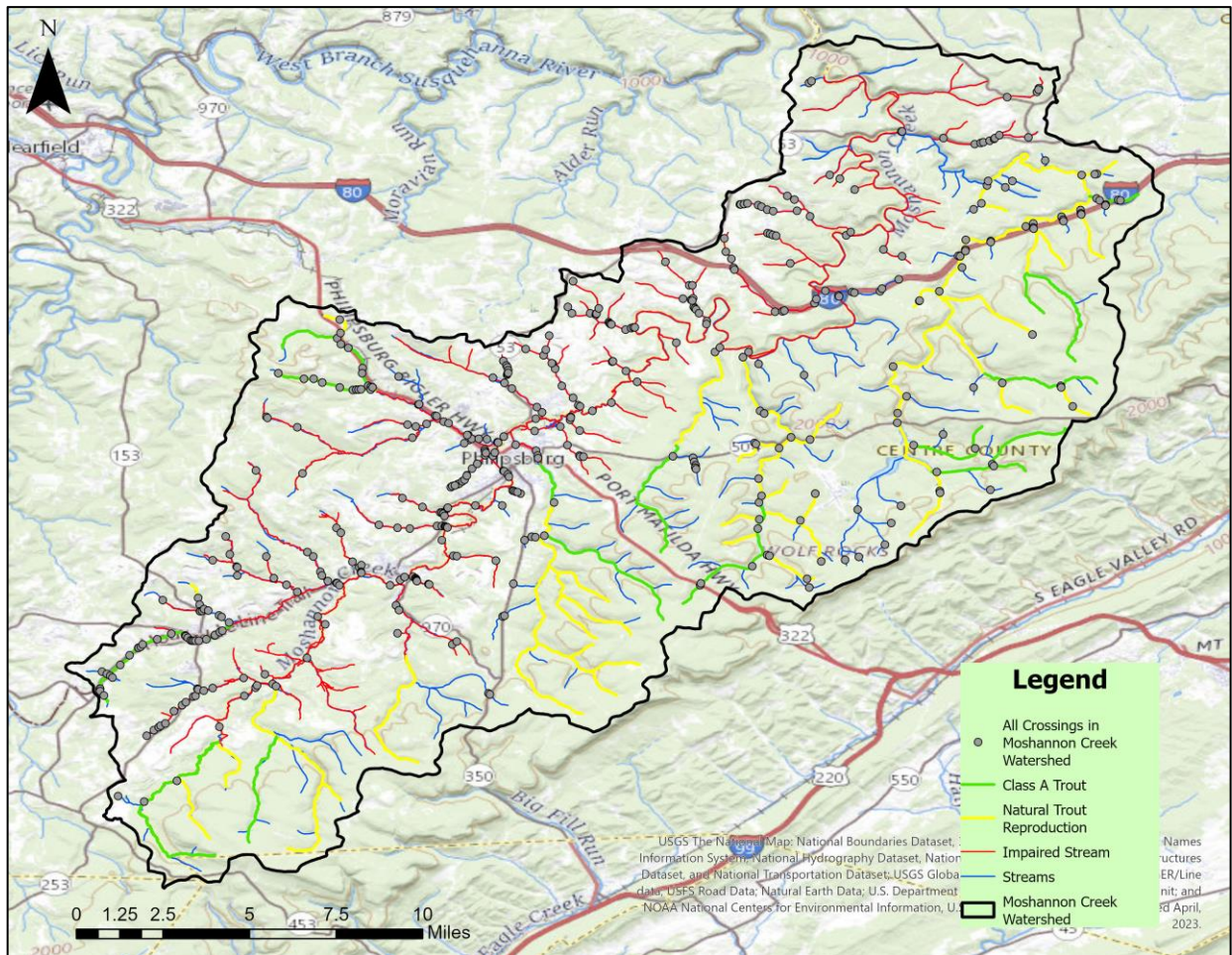


Figure 3. All unassessed crossings in Moshannon Creek watershed prior to this project.

Culvert Prioritizations

A total of 131 culverts were included in the prioritization, and 42 culverts were excluded from the prioritization due to being scored as 'Full AOP'. The majority of culverts (48.8%) were categorized either low or medium priorities, 42% were considered a high priority, and the remaining 9.2% were considered very high. Appendix B contains each culvert's prioritization score and Figure 4 shows the locations of the culverts organized by their prioritization scores.

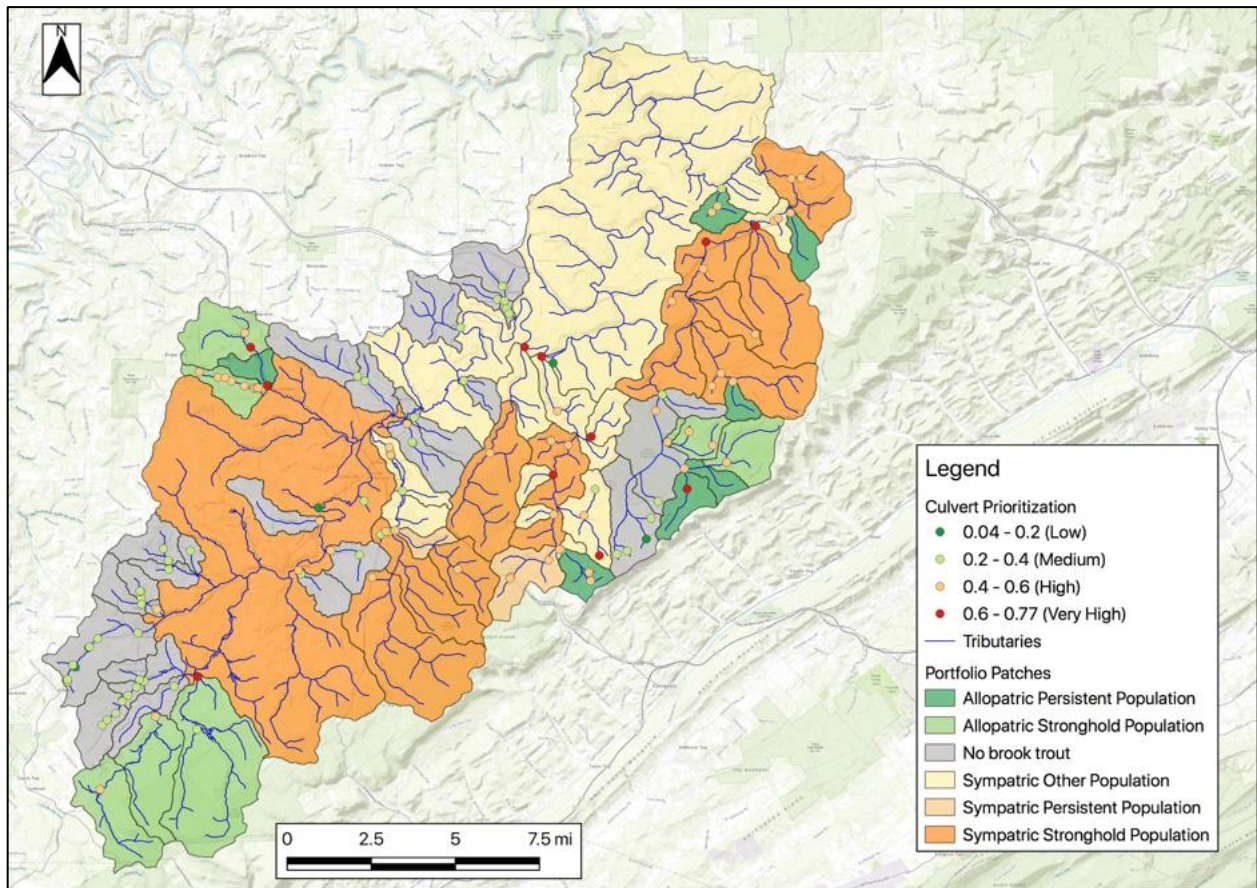


Figure 4. Prioritization of culverts for removal/replacement in the Moshannon Creek watershed, crossings that had a NAACC Coarse Screen value of ‘Full AOP’ were not included on this map. Culvert prioritization scores range from 0-1 (first legend item), with the higher scores indicating a higher priority for removal/replacement.

Example Priority Crossings

Crossing Example 1

Trim Root Run, a tributary to Mountain Branch, was a multiple culvert that had 8 pipes (Figure 5a). It shows up as a medium priority replacement, however when crews surveyed the crossing they noted it was poor and multiple pipes were clogged (Figure 5b). A NAACC coarse screen value was unable to be calculated due to inlet dimensions being unmeasurable, however a numeric score of 0.51 was able to be obtained which indicates it is a moderate barrier. If this crossing was able to have a coarse screen calculated, it is likely it would have a higher prioritization score. This crossing highlights the importance of field crew observations, and noting any crossings that appear poor while in the field. This crossing is located in an allopatric stronghold and would open ~6.33 km of habitat upstream of the crossing (Figure 6).



Figure 5a. Outlet of crossing with multiple pipes on Trim Root Run.



Figure 5b. Clogged and collapsed inlet of crossing with multiple pipes on Trim Root Run.

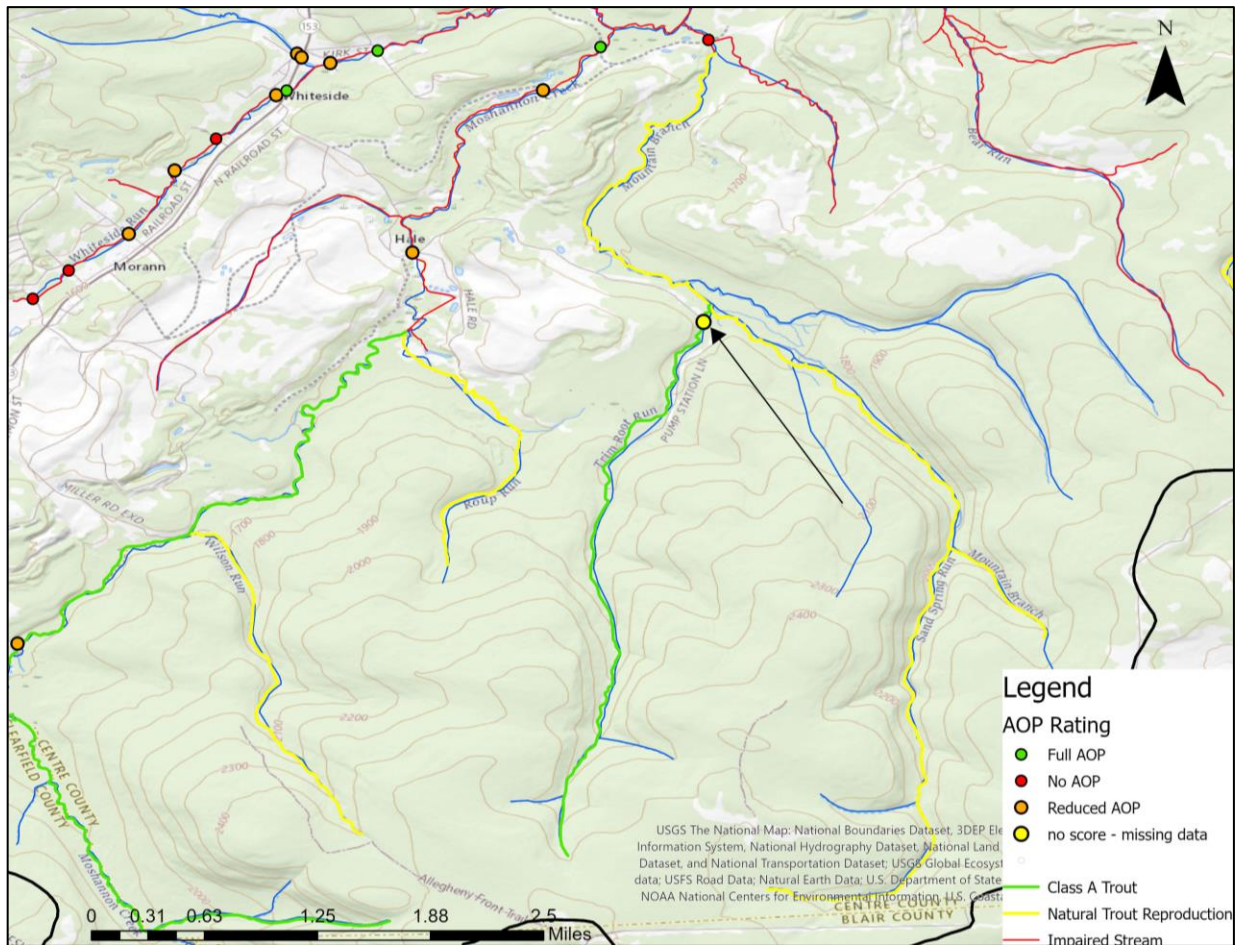


Figure 6. Location of crossing on Trim Root Run (unnamed municipal authority road) and associated water resources.

Crossing Example 2

A crossing on Black Moshannon Creek that flows under Meyers Run Road was identified through prioritization as a high priority culvert for replacement (Figure 7). Field crews also noted that this was one of the worst culverts they saw during this project. Multiple large pipes had been installed but only one was passing water at the time of the survey, as the others were clogged or collapsed. A coarse screen of ‘No AOP’ and a NAACC numeric score of 0.51 was determined from the NAACC data. If this crossing were to be replaced, it would open approximately 25.4 km of network upstream of the culvert (Figure 8).



Figure 7. Outlet of crossing on Meyers Run Road on Black Moshannon Creek.
Photo credit: Moshannon Creek Watershed Association.

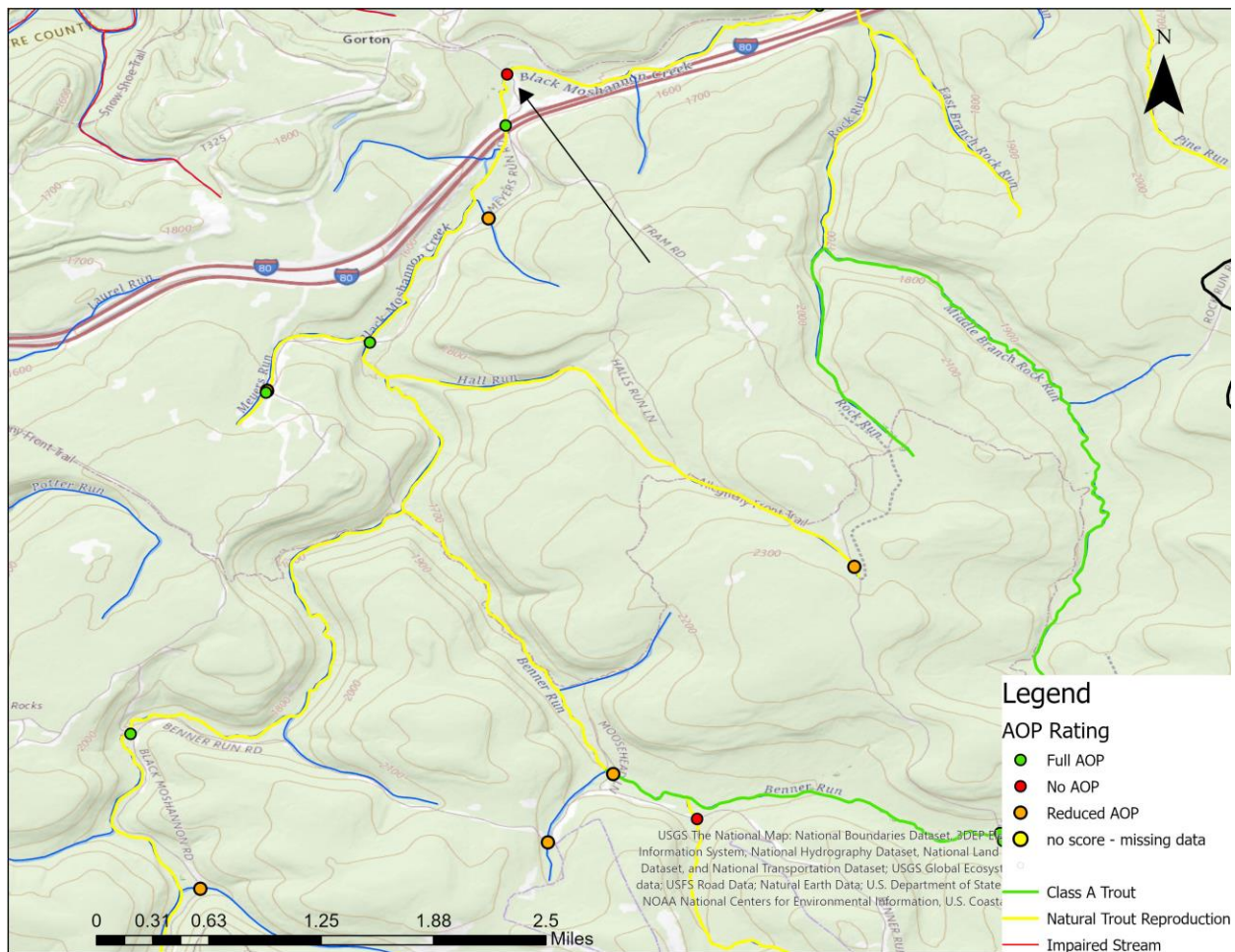


Figure 8. Location of No AOP crossing on Black Moshannon Creek (Meyers Run Road) and associated water resources.

Crossing Example 3

A private crossing on Brook Trout Lane, which crosses Moshannon Creek in its headwaters, was found to be a significant barrier with Reduced AOP (Figure 9). A coarse screen of ‘Reduced AOP’ and a NAACC numeric score of 0.39 was determined from the NAACC data. If this crossing were to be replaced, it would open approximately 9.5 km of network upstream of the culvert (Figure 10).



Figure 9. Outlet of crossing on Moshannon Creek in the headwaters.

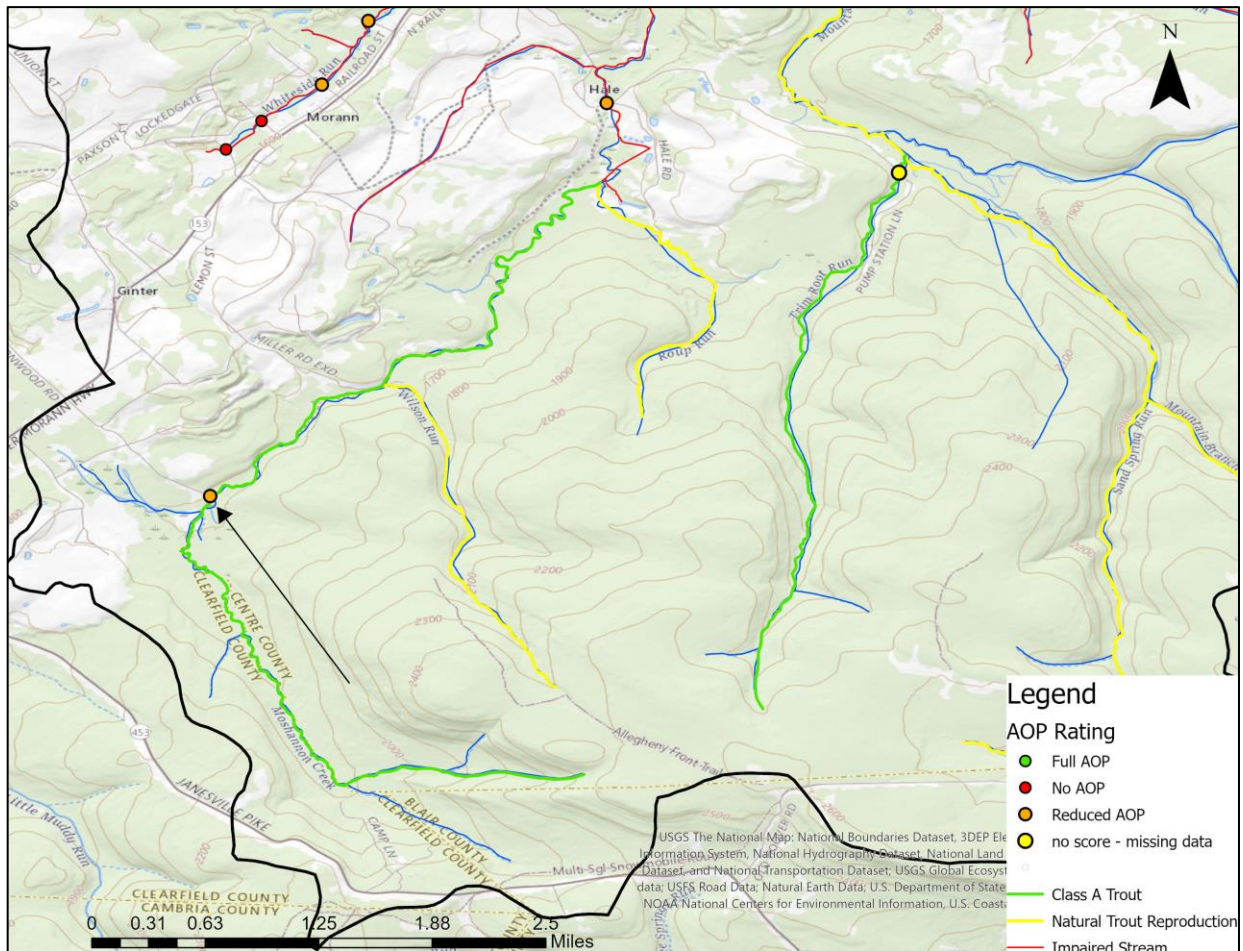


Figure 10. Location of crossing on Moshannon Creek in the headwaters (Brook Trout Lane-private) and associated water resources.

Conclusions/Recommendations

A total of 11 unassessed waters surveys occurred during this project and 45.5% of them were found to have trout populations. One stream was preliminarily identified as a Class A brook trout stream and the other four streams qualified for wild trout (natural reproduction). We encourage the PFBC to add any qualifying streams to the wild trout list and to evaluate the potential Class A stream we assessed for addition to the Class A trout list. There were 173 new NAACC surveys completed during this project, as well as 13 bridge adequate crossings and 14 that were determined to not exist at the points determined by NAACC. Of those, 61 were Full AOP and 102 were considered at least a partial barrier. Ten surveys were unable to have a NAACC coarse screen and/or NAACC numeric score calculated. From those 173, and including 19 from surveys completed prior to this project, total of 131 culverts were included in the prioritization. There were 12 culverts that were considered ‘very high’ priorities for replacement. Prioritization only includes culvert passability, trout population status, and habitat gain with replacement or removal of the culvert. It is important to note that this prioritization does not include feasibility, landowner willingness, cost, or other factors that need to be evaluated prior to the start of any replacement or removal project. Any very high or high priority culverts identified in this study should be further investigated for feasibility of replacement or removal.

The first step in evaluating high or very high priority crossings for replacement would be to identify any current plans other entities may have to replace the culvert and determine the feasibility of the project. Communicating with the local townships, municipalities, DCNR, or other road owners to identify any current plans or to alert them to problem crossings would be a good first step towards replacement. In order to fund these projects, it would be beneficial to start with the local conservation districts to determine if any funding may be available or upcoming for culvert replacement projects. Looking at the estimated project cost, landowner permission, and potential funding sources is essential when evaluating feasibility of any projects. Engaging any stakeholders is important during this process as well. There are also remaining unassessed crossings in this watershed that were unable to be evaluated during this project, these should be assessed in the future as funding and/or volunteers are available.

Acknowledgements

We would like to thank the MCWA Volunteers who assisted TU staff with completing culvert assessments as well as sharing their local knowledge of private and unmapped crossings. We would also like to thank the Clearfield County Conservation District staff who held and managed this grant.

References

Abbott, A. and S. D. Jackson. 2019. NAACC Stream Crossing Instruction Manual for Aquatic Passability Assessments in Non-tidal Stream and Rivers. North Atlantic Aquatic Connectivity Collaborative (NAACC), University of Massachusetts Amherst. June 2, 2019. 33 pp.

Fesenmyer, K.A., A.L. Haak, S.M. Rummel, M. Mayfield, S.L. McFall, and J.E. Williams. 2017. Eastern Brook Trout Conservation Portfolio, Range-wide Habitat Integrity and Future Security Assessment, and Focal Area Risk and Opportunity Analysis. Final Report to National Fish and Wildlife Foundation. Trout Unlimited, Arlington, Virginia.

North Atlantic Aquatic Connectivity Collaborative (NAACC). 2023. NAACC Data Center. Available: <https://naacc.org>.

Pennsylvania Fish and Boat Commission (PFBC). 2015. Sampling procedures for unassessed streams in Pennsylvania.

Pennsylvania Fish and Boat Commission (PFBC). 2019. Trout Water Classifications. Available: <https://www.fishandboat.com/Fish/PennsylvaniaFishes/Trout/Pages/TroutWaterClassifications.aspx>

United States Geological Survey (USGS). 2020. National Hydrography Dataset Plus HR. Available: <https://www.usgs.gov/national-hydrography/nhdplus-high-resolution>

Appendix A. Information on NAACC Scoring System

NAACC Coarse Screen

Identifies characteristics and conditions that allow crossings to be classified as providing “Full AOP,” “Reduced AOP,” or “No AOP.”

Metric	Flow Condition	Crossing Classification		
		Full AOP	Reduced AOP	No AOP
		<i>If all are true</i>	<i>If any are true</i>	<i>If any are true</i>
Inlet Grade		At Stream Grade	Inlet Drop or Perched	
Outlet Grade		At Stream Grade		Cascade, Free Fall onto Cascade
Outlet Drop to Water Surface		= 0		≥ 1 ft
Outlet Drop to Water Surface/Outlet Drop to Stream Bottom				> 0.5 ft
Inlet or Outlet Water Depth	Typical-Low	> 0.3 ft		<0.3 ft w/Outlet Drop to Water Surface >0
	Moderate	> 0.4 ft		<0.4 ft w/Outlet Drop to Water Surface >0
Structure Substrate Matches Stream		Comparable or Contrasting		
Structure Substrate Coverage		100%	<100%	
Physical Barrier Severity		None	Minor or Moderate	Severe

NAACC Numeric Passability Scores

Aquatic passability scores and corresponding determined AOP descriptor

Descriptor	Aquatic Passability Score(s)
No barrier	1.0
Insignificant barrier	0.80 – 0.99
Minor barrier	0.60 – 0.79
Moderate barrier	0.40 – 0.59
Significant barrier	0.20 – 0.39
Severe barrier	0.00 – 0.19

Appendix B. Culverts Assessed during this project with prioritization scores, this excludes all crossings that scored as “Full AOP”. This table includes crossing assessments completed prior to this project.

Survey ID	Date	NAACC Passability Score	NAACC Coarse Screen	Prioritization Score
92369	7/21/22	0	No AOP	0.22740542
94305	3/8/23	0.03448254	No AOP	0.23155781
92556	10/12/22	0.13043458	No AOP	0.26051854
94351	3/9/23	0	No AOP	0.27038186
92697	10/26/22	0.03448254	No AOP	0.28272686
92234	8/29/22	0.40677952	No AOP	0.3066366
92739	10/19/22	0.35835297	No AOP	0.30885704
92791	10/26/22	0.4660733	No AOP	0.31361886
92736	10/19/22	0.46286405	No AOP	0.32004836
94297	3/9/23	0.3083671	No AOP	0.32523254
80777	11/5/20	0.55821038	No AOP	0.33321283
36732	8/8/16	0.22413775	No AOP	0.33361841
80778	11/5/20	0.59746016	No AOP	0.34023922
92478	9/1/22	0.40677952	No AOP	0.34403162
92371	7/21/22	0.64735947	No AOP	0.36133358
92561	10/12/22	0	No AOP	0.37617021
92559	10/12/22	0.01241512	No AOP	0.38042002
92560	10/12/22	0.13043458	No AOP	0.40252597
36881	8/10/16	0.09307224	No AOP	0.41057437
95247	5/3/23	0.33164443	No AOP	0.44438061
91511	8/8/22	0.51363785	No AOP	0.45246506
95250	5/3/23	0.01241512	No AOP	0.4564887
92614	10/11/22	0.03448254	No AOP	0.46490441
95249	5/3/23	0.46053647	No AOP	0.47385081
94891	5/3/23	0.74328465	No AOP	0.48434038
36880	8/10/16	0.55916693	No AOP	0.4850728
92617	10/11/22	0.18604632	No AOP	0.48922826
94350	3/9/23	0.39566728	No AOP	0.49871274
95785	5/3/23	0.61218827	No AOP	0.51175786
92618	10/11/22	0.5610624	No AOP	0.5582631
92616	10/11/22	0.56086201	No AOP	0.56095044

Survey ID	Date	NAACC Passability Score	NAACC Coarse Screen	Prioritization Score
36646	8/8/16	0.40677952	No AOP	0.56456243
94384	3/30/23	0.70875424	No AOP	0.58391327
36746	8/9/16	0.49999988	No AOP	0.58487437
36742	8/9/16	0.33164443	No AOP	0.58958628
36749	8/10/16	0.74284331	No AOP	0.60587204
92670	8/11/22	0.70652995	No AOP	0.62114567
92588	10/11/22	0.52486295	No AOP	0.62423284
36750	8/10/16	0.64453474	No AOP	0.63629557
92790	10/26/22	0.49853403	No AOP	0.6434751
94344	3/9/23	0.505425	No AOP	0.67566325
92491	9/20/22	-1	No Score	0.0375
92492	9/20/22	-1	No Score	0.0375
92476	8/29/22	-1	No Score	0.075
92485	9/1/22	-1	No Score	0.075
94371	3/16/23	-1	No Score	0.15
92581	10/11/22	0.1	No Score	0.16875
92498	9/20/22	-1	No Score	0.1875
92668	8/10/22	1	No Score	0.225
94314	3/16/23	0.50991289	No Score	0.35810867
91693	8/10/22	0.97106987	No Score	0.4820756
36620	8/8/16	0.33164443	Reduced AOP	0.19790075
92368	7/21/22	0.67118803	Reduced AOP	0.25752894
92367	7/21/22	0.68145059	Reduced AOP	0.26512845
92470	8/29/22	0.7299245	Reduced AOP	0.2686039
92695	10/26/22	0.72572677	Reduced AOP	0.27100932
92669	8/11/22	0.73626692	Reduced AOP	0.27153146
36644	8/8/16	0.74737633	Reduced AOP	0.27383484
92655	10/24/22	0.62856329	Reduced AOP	0.2749093
92472	8/29/22	0.70194959	Reduced AOP	0.27905209
92664	8/10/22	0.79177197	Reduced AOP	0.28044073
92756	10/26/22	0.76764132	Reduced AOP	0.28459195
92752	10/24/22	0.80072342	Reduced AOP	0.28597388
92758	10/26/22	0.82382227	Reduced AOP	0.28610276
92375	7/21/22	0.79139369	Reduced AOP	0.28938056

Survey ID	Date	NAACC Passability Score	NAACC Coarse Screen	Prioritization Score
94312	3/16/23	0.81841831	Reduced AOP	0.29002446
92737	10/19/22	0.80057095	Reduced AOP	0.29132513
92473	8/29/22	0.81413502	Reduced AOP	0.29238595
92760	10/26/22	0.87104494	Reduced AOP	0.29954769
92757	10/26/22	0.86852974	Reduced AOP	0.30395157
92493	9/20/22	0.85831076	Reduced AOP	0.30404309
92740	10/19/22	0.91403046	Reduced AOP	0.30593623
92751	10/24/22	0.93622714	Reduced AOP	0.30724509
92735	10/19/22	0.85358	Reduced AOP	0.30860966
92483	9/1/22	0.76348706	Reduced AOP	0.31291596
92683	10/26/22	0.86669461	Reduced AOP	0.31302406
92477	8/29/22	0.77437386	Reduced AOP	0.32095248
92788	10/26/22	0.98196203	Reduced AOP	0.35769332
92748	10/24/22	0.51269683	Reduced AOP	0.35826953
92686	10/26/22	0.47215451	Reduced AOP	0.35898355
92690	10/26/22	0.8599399	Reduced AOP	0.36459203
92475	8/29/22	0.97452659	Reduced AOP	0.37155513
92479	9/1/22	0.93648399	Reduced AOP	0.37203719
94296	3/9/23	0.63567905	Reduced AOP	0.37829393
92742	10/19/22	0.7255	Reduced AOP	0.3821329
92749	10/24/22	0.76546896	Reduced AOP	0.38837596
94300	3/9/23	0.54901379	Reduced AOP	0.38927396
91484	8/8/22	0.07894716	Reduced AOP	0.39492911
36747	8/9/16	-1	Reduced AOP	0.39510612
94346	3/9/23	0.43730173	Reduced AOP	0.4034393
92747	10/24/22	0.8569	Reduced AOP	0.40462533
36878	8/10/16	0.66075488	Reduced AOP	0.40572433
94373	3/16/23	0.70097342	Reduced AOP	0.41342728
94316	3/9/23	0.69532267	Reduced AOP	0.41880685
92558	10/12/22	0.73923693	Reduced AOP	0.42044251
92557	8/8/22	0.73532918	Reduced AOP	0.42210755
94109	2/23/23	0.38662695	Reduced AOP	0.43118765
94333	3/9/23	0.79456955	Reduced AOP	0.43334352
82440	6/2/21	0.7182645	Reduced AOP	0.44489652

Survey ID	Date	NAACC Passability Score	NAACC Coarse Screen	Prioritization Score
92673	8/11/22	0.49999988	Reduced AOP	0.45229483
92663	8/10/22	0.62712482	Reduced AOP	0.4608158
92741	10/24/22	0.80597498	Reduced AOP	0.46199142
92613	10/11/22	0.58668945	Reduced AOP	0.46727885
92675	8/11/22	0.8371363	Reduced AOP	0.47783091
92376	7/21/22	0.65557982	Reduced AOP	0.48014186
91695	8/10/22	0.83594272	Reduced AOP	0.48062875
92563	9/20/22	0.68820018	Reduced AOP	0.48711618
92589	10/11/22	0.9298882	Reduced AOP	0.49376328
36743	8/9/16	0.71687689	Reduced AOP	0.50380897
92615	10/11/22	0.77642696	Reduced AOP	0.50478603
94385	3/30/23	0.4257297	Reduced AOP	0.51173097
92674	8/11/22	0.7911719	Reduced AOP	0.51452137
92494	9/20/22	0.81149634	Reduced AOP	0.52123607
87559	7/15/21	0.93569872	Reduced AOP	0.52335425
92671	8/11/22	0.85679969	Reduced AOP	0.52824516
92750	10/24/22	0.93558066	Reduced AOP	0.53382882
92682	10/26/22	0.93315192	Reduced AOP	0.53947145
94408	3/30/23	0.91444925	Reduced AOP	0.5397814
92496	9/20/22	0.91718869	Reduced AOP	0.55950922
36740	8/9/16	0.97031634	Reduced AOP	0.57649606
36741	8/9/16	0.93792978	Reduced AOP	0.57913934
92662	8/10/22	0.63935921	Reduced AOP	0.58183644
92562	10/12/22	0.87915573	Reduced AOP	0.5829144
92759	10/26/22	0.53685752	Reduced AOP	0.58694486
91501	8/8/22	0.69984948	Reduced AOP	0.59800164
94407	3/30/23	0.97282144	Reduced AOP	0.60775848
95246	4/3/23	0.803	Reduced AOP	0.62123137
92585	10/11/22	0.80154281	Reduced AOP	0.63824745
92666	8/10/22	0.82668921	Reduced AOP	0.64433992
93463	11/3/22	0.7882	Reduced AOP	0.65607243
94370	3/16/23	0.81822746	Reduced AOP	0.77171987

Appendix C. Crossing assessment AOP details for all crossings.

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
92688	1.00	Full AOP	No barrier	-78.16955	40.95490	Moshannon Creek
92693	1.00	Full AOP	No barrier	-78.19625	40.91714	UNT to Moshannon Creek
92694	1.00	Full AOP	No barrier	-78.19625	40.91744	UNT to Moshannon Creek
92743	1.00	Full AOP	No barrier	-78.14466	40.89861	UNT to black bear run
92744	1.00	Full AOP	No barrier	-78.14414	40.89721	UNT to black bear run
92745	1.00	Full AOP	No barrier	-78.14421	40.89642	UNT to black bear run
92746	1.00	Full AOP	No barrier	-78.14391	40.89567	UNT to black bear run
92789	1.00	Full AOP	No barrier	-78.32792	40.80444	Moshannon creek
82441	1.00	Full AOP	No barrier	-78.20539	40.86726	Tomtit Run
82442	1.00	Full AOP	No barrier	-78.19871	40.86282	Tomtit Run
83624	1.00	Full AOP	No barrier	-78.21103	40.82122	Cold Stream
83627	1.00	Full AOP	No barrier	-78.19115	40.86146	Tomtit Run
83629	1.00	Full AOP	No barrier	-78.19802	40.86231	Tomtit Run
80776	1.00	Full AOP	No barrier	-78.35301	40.80097	Whiteside Run
92564	1.00	Full AOP	No barrier	-78.34031	40.86777	UNT to Little Beaver Run
92565	1.00	Full AOP	No barrier	-78.22479	40.83409	UNT to Cold Stream
92672	1.00	Full AOP	No barrier	-78.02098	40.88684	Smays Run
92677	1.00	Full AOP	No barrier	-78.11576	40.91899	Sixmile Run
94301	1.00	Full AOP	No barrier	-78.22239	40.89363	Moshannon creek
94302	1.00	Full AOP	No barrier	-78.22170	40.89383	Moshannon
94303	1.00	Full AOP	No barrier	-78.22834	40.90355	Moshannon creek
94304	1.00	Full AOP	No barrier	-78.22861	40.90145	Moshannon creek
94332	1.00	Full AOP	No barrier	-78.04235	40.96992	Black Moshannon Creek
94347	1.00	Full AOP	No barrier	-78.05072	40.96589	Meyers Run
94348	1.00	Full AOP	No barrier	-78.03144	40.98734	Black Moshannon Creek
94349	1.00	Full AOP	No barrier	-78.02187	41.01602	Black Moshannon Creek
94369	1.00	Full AOP	No barrier	-78.13961	40.95630	Moshannon Creek
80780	1.00	Full AOP	No barrier	-78.34574	40.80417	Whiteside Run
91694	1.00	Full AOP	No barrier	-78.04211	40.88658	Shirks Run
92372	1.00	Full AOP	No barrier	-78.35110	40.83618	UNT to Goss Run
92484	1.00	Full AOP	No barrier	-78.38433	40.81378	Beaver Run
92486	1.00	Full AOP	No barrier	-78.27177	40.84717	Moshannon Creek

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
92487	1.00	Full AOP	No barrier	-78.26564	40.85051	Moshannon Creek
92495	1.00	Full AOP	No barrier	-78.25012	40.86606	Moshannon Creek
95245	1.00	Full AOP	No barrier	-78.00618	40.99699	Black Moshannon creek
92689	0.94	Full AOP	Insignificant barrier	-78.17103	40.95450	UNT to Moshannon Creek
92691	0.94	Full AOP	Insignificant barrier	-78.17014	40.95492	UNT to Moshannon Creek
92692	0.98	Full AOP	Insignificant barrier	-78.21044	40.92148	Emigh Run
92696	0.87	Full AOP	Insignificant barrier	-78.22395	40.93170	Emigh Run
92738	0.85	Full AOP	Insignificant barrier	-78.14595	40.96635	UNT to Sulphur Run
93464	0.93	Full AOP	Insignificant barrier	-78.13598	40.94452	Black Bear Run
92586	0.97	Full AOP	Insignificant barrier	-78.27972	40.92889	Simeling Run
92660	0.84	Full AOP	Insignificant barrier	-78.10432	40.90903	Sixmile Run
92667	0.90	Full AOP	Insignificant barrier	-78.07673	40.87867	Black Moshannon Creek
92676	0.87	Full AOP	Insignificant barrier	-78.02007	40.89778	Smays Run
92684	0.85	Full AOP	Insignificant barrier	-78.17927	40.92349	Wolf Run
94306	0.95	Full AOP	Insignificant barrier	-78.36939	40.82580	Beaver run
94308	0.95	Full AOP	Insignificant barrier	-78.35653	40.82508	Beaver run
94310	0.87	Full AOP	Insignificant barrier	-78.35749	40.82592	Beaver run
91482	0.95	Full AOP	Insignificant barrier	-78.06159	40.93846	Black Moshannon Creek
91503	0.91	Full AOP	Insignificant barrier	-78.05985	40.91504	Black Moshannon Creek
92370	0.88	Full AOP	Insignificant barrier	-78.34769	40.83653	Goss Run
92373	0.86	Full AOP	Insignificant barrier	-78.35014	40.83649	Unto to Goss
92374	0.83	Full AOP	Insignificant barrier	-78.34894	40.83726	Goss run
92377	0.98	Full AOP	Insignificant barrier	-78.34181	40.82820	Beaver Run
92474	0.90	Full AOP	Insignificant barrier	-78.36531	40.82692	Beaver Run
92480	0.89	Full AOP	Insignificant barrier	-78.35437	40.82399	Beaver Run
92481	0.86	Full AOP	Insignificant barrier	-78.35161	40.82398	Beaver Run
92482	0.98	Full AOP	Insignificant barrier	-78.34815	40.82459	Beaver Run
36734	0.99	Full AOP	Insignificant barrier	-78.11816	40.87082	Sixmile Run
36744	0.99	Full AOP	Insignificant barrier	-78.11632	40.88440	Sixmile Run
92499	0.89	Full AOP	Insignificant barrier	-78.25813	40.87992	UNT to Moshannon
94402	0.99	Full AOP	Insignificant barrier	-78.28321	40.93791	Laurel run
94403	0.84	Full AOP	Insignificant barrier	-78.28336	40.93576	Laurel run
94404	0.99	Full AOP	Insignificant barrier	-78.29230	40.94786	Laurel Run
94405	0.90	Full AOP	Insignificant barrier	-78.29379	40.95038	Laurel Run
94406	0.89	Full AOP	Insignificant barrier	-78.29275	40.95808	UNT Trib to Laurel Run

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
94410	0.88	Full AOP	Insignificant barrier	-77.99142	40.92985	Benner Run
94411	0.92	Full AOP	Insignificant barrier	-77.99164	40.93049	Benner Run
92526	0.95	Full AOP	Insignificant barrier	-78.22401	40.83441	UNT to Cold Stream
92690	0.86	Reduced AOP	Insignificant barrier	-78.17029	40.95479	UNT to Moshannon
92735	0.85	Reduced AOP	Insignificant barrier	-78.14668	40.97239	Sulphur Run
92737	0.80	Reduced AOP	Insignificant barrier	-78.14546	40.96611	Sulphur Run
92740	0.91	Reduced AOP	Insignificant barrier	-78.14437	40.96283	Sulphur Run
92741	0.81	Reduced AOP	Insignificant barrier	-78.15359	40.90099	Black bear run
92747	0.86	Reduced AOP	Insignificant barrier	-78.20989	40.90024	Cold stream
92750	0.94	Reduced AOP	Insignificant barrier	-78.21074	40.90341	Cold stream
92751	0.94	Reduced AOP	Insignificant barrier	-78.19763	40.90572	One mile run
92752	0.80	Reduced AOP	Insignificant barrier	-78.36570	40.78941	Whiteside Run
92757	0.87	Reduced AOP	Insignificant barrier	-78.35214	40.80388	UNT to Whiteside run
92758	0.82	Reduced AOP	Insignificant barrier	-78.35180	40.80364	UNT to Whiteside run
92760	0.87	Reduced AOP	Insignificant barrier	-78.35382	40.80060	Whiteside run
92788	0.98	Reduced AOP	Insignificant barrier	-78.33252	40.80100	Moshannon creek
92562	0.88	Reduced AOP	Insignificant barrier	-78.20732	40.86785	Cold Stream
92585	0.80	Reduced AOP	Insignificant barrier	-78.27977	40.92996	Laurel run
92589	0.93	Reduced AOP	Insignificant barrier	-78.28294	40.92899	Simeling Run
92666	0.83	Reduced AOP	Insignificant barrier	-78.04202	40.88588	Shirks Run
92671	0.86	Reduced AOP	Insignificant barrier	-78.01962	40.89695	Smays Run
92675	0.84	Reduced AOP	Insignificant barrier	-78.09753	40.84943	UNT to Sixmile Run
92682	0.93	Reduced AOP	Insignificant barrier	-78.20056	40.91351	Onemile Run
92683	0.87	Reduced AOP	Insignificant barrier	-78.19653	40.91633	UNT to Moshannon
94312	0.82	Reduced AOP	Insignificant barrier	-78.35058	40.80415	Whiteside run
94370	0.82	Reduced AOP	Insignificant barrier	-78.12432	40.94235	Sixmile Run
87559	0.94	Reduced AOP	Insignificant barrier	-78.02267	40.93535	Benner Run
91695	0.84	Reduced AOP	Insignificant barrier	-78.09674	40.84614	UNT to Sixmile Run
92473	0.81	Reduced AOP	Insignificant barrier	-78.33857	40.86003	UNT Little Beaver Run
92475	0.97	Reduced AOP	Insignificant barrier	-78.38050	40.81787	Beaver Run
92479	0.94	Reduced AOP	Insignificant barrier	-78.35301	40.82389	Beaver Run
92493	0.86	Reduced AOP	Insignificant barrier	-78.26062	40.84928	UNT to Moshannon
92494	0.81	Reduced AOP	Insignificant barrier	-78.24381	40.85923	UNT to Moshannon
36740	0.97	Reduced AOP	Insignificant barrier	-78.14191	40.84783	Sixmile Run
36741	0.94	Reduced AOP	Insignificant barrier	-78.14194	40.84769	Sixmile Run

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
92496	0.92	Reduced AOP	Insignificant barrier	-78.25003	40.87189	Shimel Run
94407	0.97	Reduced AOP	Insignificant barrier	-78.28920	40.94631	Laurel Run
94408	0.91	Reduced AOP	Insignificant barrier	-78.29250	40.95248	UNT to Laurel Run
95246	0.80	Reduced AOP	Insignificant barrier	-78.00312	40.99828	East branch rock run
92695	0.73	Reduced AOP	Minor barrier	-78.22433	40.93188	Emigh Run
92742	0.73	Reduced AOP	Minor barrier	-78.14273	40.96075	Sulphur Run
92749	0.77	Reduced AOP	Minor barrier	-78.21014	40.90136	Cold stream
92756	0.77	Reduced AOP	Minor barrier	-78.36195	40.79456	Whiteside Run
93463	0.79	Reduced AOP	Minor barrier	-78.13403	40.94644	Black Bear Run
94296	0.64	Reduced AOP	Minor barrier	-78.20325	40.88474	Unto to cold stream
82440	0.72	Reduced AOP	Minor barrier	-78.17189	40.85119	Tomtit Run
92563	0.69	Reduced AOP	Minor barrier	-78.26199	40.85079	UNT to Moshannon
92615	0.78	Reduced AOP	Minor barrier	-78.30367	40.93332	Simeling run
92655	0.63	Reduced AOP	Minor barrier	-78.19726	40.90534	One mile run
92662	0.64	Reduced AOP	Minor barrier	-78.05295	40.90563	North Run
92663	0.63	Reduced AOP	Minor barrier	-78.04330	40.89429	Smays Run
92664	0.79	Reduced AOP	Minor barrier	-78.05872	40.88015	UNT to Black Moshannon
92669	0.74	Reduced AOP	Minor barrier	-78.08173	40.85770	UNT to Black Moshannon
92674	0.79	Reduced AOP	Minor barrier	-78.02716	40.90427	North Run
94316	0.70	Reduced AOP	Minor barrier	-78.03281	40.97988	UNT to Black Moshannon
94333	0.79	Reduced AOP	Minor barrier	-78.05061	40.96603	UNT to Black Moshannon
94373	0.70	Reduced AOP	Minor barrier	-78.00337	40.95189	Hall Run
91501	0.70	Reduced AOP	Minor barrier	-78.05969	40.91912	Black Moshannon Creek
92367	0.68	Reduced AOP	Minor barrier	-78.35189	40.84191	Goss Run
92368	0.67	Reduced AOP	Minor barrier	-78.35136	40.84161	Unto to Goss run
92375	0.79	Reduced AOP	Minor barrier	-78.34318	40.83448	Goss Run
92376	0.66	Reduced AOP	Minor barrier	-78.34211	40.83397	Goss Run
92470	0.73	Reduced AOP	Minor barrier	-78.33547	40.85463	Little Beaver Run
92472	0.70	Reduced AOP	Minor barrier	-78.33587	40.85497	Little Beaver Run
92477	0.77	Reduced AOP	Minor barrier	-78.38994	40.81010	Beaver Run
92483	0.76	Reduced AOP	Minor barrier	-78.39291	40.80393	UNT to Beaver Run
36644	0.75	Reduced AOP	Minor barrier	-78.07582	40.85909	Tributary to Sixmile Run
36743	0.72	Reduced AOP	Minor barrier	-78.11771	40.87458	Sixmile Run
36878	0.66	Reduced AOP	Minor barrier	-78.11887	40.90635	Tributary to Sixmile Run
92557	0.74	Reduced AOP	Minor barrier	-78.02803	40.92976	UNT to Benner Run

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
92558	0.74	Reduced AOP	Minor barrier	-78.22026	40.84772	UNT to Cold Stream
92748	0.51	Reduced AOP	Moderate barrier	-78.20966	40.89995	Cold stream
92759	0.54	Reduced AOP	Moderate barrier	-78.34289	40.78807	Moshannon creek
92613	0.59	Reduced AOP	Moderate barrier	-78.31840	40.93575	Simeling run
92673	0.50	Reduced AOP	Moderate barrier	-78.04071	40.91016	North Run
92686	0.47	Reduced AOP	Moderate barrier	-78.16858	40.93208	Barlow Hollow
94300	0.55	Reduced AOP	Moderate barrier	-78.22457	40.88052	UNT
94346	0.44	Reduced AOP	Moderate barrier	-78.02796	41.00415	UNT to Black Moshannon
94385	0.43	Reduced AOP	Moderate barrier	-78.28501	40.92930	Simeling Run
94109	0.39	Reduced AOP	Significant barrier	-78.37457	40.75672	Moshannon Creek
36620	0.33	Reduced AOP	Significant barrier	-78.06503	40.86419	unknown
91484	0.08	Reduced AOP	Severe barrier	-78.05599	40.92604	UNT to Black Moshannon
36747	-1.00	Reduced AOP	no score	-78.09520	40.88527	UNT to Sixmile Run
92670	0.71	No AOP	Minor barrier	-78.09232	40.85704	UNT to Sixmile Run
94384	0.71	No AOP	Minor barrier	-78.28735	40.92928	Simeling Run
92371	0.65	No AOP	Minor barrier	-78.35080	40.83623	Unto to Goss Run
36749	0.74	No AOP	Minor barrier	-78.11799	40.89131	Tributary to Sixmile Run
36750	0.64	No AOP	Minor barrier	-78.09642	40.90784	Hutton Run
95785	0.61	No AOP	Minor barrier	-77.98386	41.00386	Pine Run
94891	0.74	No AOP	Minor barrier	-77.99038	41.00148	UNT to Black Moshannon
92736	0.46	No AOP	Moderate barrier	-78.14556	40.97241	UNT to Sulphur Road
92790	0.50	No AOP	Moderate barrier	-78.31928	40.80501	Mountain branch
92791	0.47	No AOP	Moderate barrier	-78.37329	40.78431	Whiteside Run
80777	0.56	No AOP	Moderate barrier	-78.35864	40.79712	Whiteside Run
92588	0.52	No AOP	Moderate barrier	-78.28386	40.92895	Simeling run
92616	0.56	No AOP	Moderate barrier	-78.29277	40.92978	Simeling run
92618	0.56	No AOP	Moderate barrier	-78.30013	40.93185	Simeling run
94344	0.51	No AOP	Moderate barrier	-78.03130	40.99146	Black Moshannon Creek
80778	0.60	No AOP	Moderate barrier	-78.37044	40.78659	Whiteside Run
91511	0.51	No AOP	Moderate barrier	-78.01605	40.93162	Benner Run
92234	0.41	No AOP	Moderate barrier	-78.33560	40.85113	UNT to Little Beaver Run
92478	0.41	No AOP	Moderate barrier	-78.39287	40.80296	Beaver Run
36646	0.41	No AOP	Moderate barrier	-78.11426	40.85979	unknown
36746	0.50	No AOP	Moderate barrier	-78.10052	40.87435	Corgin Run
36880	0.56	No AOP	Moderate barrier	-78.11925	40.90678	Tributary to Sixmile Run

Survey ID	APS 0-1.0	AOP Rating	Barrier Evaluation	Longitude	Latitude	Stream Name
95249	0.46	No AOP	Moderate barrier	-77.97715	41.01873	McKinney Run
92739	0.36	No AOP	Significant barrier	-78.14941	40.96678	UNT to Sulphur run
94297	0.31	No AOP	Significant barrier	-78.37568	40.82159	Beaver run
94350	0.40	No AOP	Significant barrier	-78.02477	41.00676	UNT to Black Moshannon
36732	0.22	No AOP	Significant barrier	-78.11285	40.85960	unknown
36742	0.33	No AOP	Significant barrier	-78.12043	40.85516	Sixmile Run
95247	0.33	No AOP	Significant barrier	-77.99279	41.00021	UNT to Black Moshannon
92697	0.03	No AOP	Severe barrier	-78.22870	40.93390	Emigh Lake
92559	0.01	No AOP	Severe barrier	-78.21561	40.86604	UNT to Cold Stream
92560	0.13	No AOP	Severe barrier	-78.21256	40.86741	UNT to Cold Stream
92561	0.00	No AOP	Severe barrier	-78.21101	40.86724	UNT to Cold Stream
92614	0.03	No AOP	Severe barrier	-78.30771	40.93342	Simeling Run
92617	0.19	No AOP	Severe barrier	-78.28728	40.92878	Simeling run
94305	0.03	No AOP	Severe barrier	-78.32339	40.85908	UNT
94351	0.00	No AOP	Severe barrier	-78.02241	41.01421	UNT to Black Moshannon
92369	0.00	No AOP	Severe barrier	-78.35132	40.83908	Goss run
36881	0.09	No AOP	Severe barrier	-78.10953	40.90442	Tributary to Sixmile Run
95250	0.01	No AOP	Severe barrier	-77.98279	41.01853	McKinney Run
92556	0.13	No AOP	Severe barrier	-78.22756	40.85743	UNT to Moshannon Creek
92668	1.00	No Score	No barrier	-78.06246	40.87316	UNT to Black Moshannon
91693	0.97	No Score	Insignificant barrier	-78.11576	40.91899	Sixmile Run
94314	0.51	No Score	Moderate barrier	-78.31969	40.78239	Trim root run
92581	0.10	No Score	Severe barrier	-78.27912	40.92987	Laurel Run
94371	-1.00	No Score	No Score	-78.11788	40.93958	Groe Run
92476	-1.00	No Score	No Score	-78.38098	40.81763	Beaver Run
92485	-1.00	No Score	No Score	-78.38858	40.80928	UNT to Beaver Run
92491	-1.00	No Score	No Score	-78.26093	40.84981	UNT to Moshannon creek
92492	-1.00	No Score	No Score	-78.26122	40.85014	UNT to Moshannon creek
92498	-1.00	No Score	No Score	-78.25072	40.87754	UNT to Moshannon Creek