

**Pennsylvania Department of Environmental Protection
Bureau of Abandoned Mine Reclamation (BAMR)
Acid Mine Drainage Division
Cambria Office**

Aultman's Run Biological Assessment (USGS HUC 05010007000406)

Prepared by
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Dates Sampled: May 2022

Introduction

Aultman's Run is a 15.1-kilometer (km) stream that flows from its source southwest of Homer City, PA, in Indiana County, south to its confluence with the Conemaugh River Reservoir (Figure 1). The Aultman's Run watershed is a 150.1-km² area. The land use is primarily agricultural and rural. The area is a mix of public and private land ownership, including State Game Lands (SGL) 332 and a small section of SGL 411. The Pennsylvania Fish and Boat Commission (PFBC) and Indiana County Conservation District (ICCD) are interested in watershed restoration and are motivated in perusing abandoned mine reclamation efforts. There are no special regulations for fishing in the Aultman's Run Watershed.

The Pennsylvania Department of Environmental Protection (PA DEP) Chapter 93 designation for Aultman's Run is Trout Stocked Fishes (TSF) (PA DEP 1999). Acid Mine Drainage (AMD) has been a major factor in causing water quality degradation in the Aultman's Run Watershed. Most of the AMD is associated with problem areas located in the headwaters of Neal Run and Coal Run. Aultman's Run Watershed has seen several restoration efforts through Growing Greener grants and is currently under an Abandoned Mine Lands (AML) project on SGL 332 on Coal Run, a tributary to Aultman's Run. Aultman's Run downstream of Reeds Run has a high potential for restoration. Remediation of several AMLs on Reeds Run and Neal Run have been beneficial to the water quality in the affected areas, although negative impacts to habitat from agricultural, residential homes and roads predominately along Reeds Run and Aultman's Run upstream of Reeds Run will prevent full recovery.

The purpose of this survey was to 1) compile a comprehensive water quality and biological data summary for the Aultman's Run Watershed and associated waters, 2) assess water quality through the occurrence of macroinvertebrates for the Index of Biotic Integrity (IBI) and relative abundance of fishes in the Aultman's Run Watershed and the associated waters, 3) use the data to update ongoing management plans for AMD treatment in the Aultman's Run Watershed and the associated waters, 4) collect and enumerate all fish species for future IBI and 5) provide the data to organizations involved with water quality and recreational improvement in the Aultman's Run Watershed and the associated waters.

Methods

Seven (7) macroinvertebrates and six (6) electrofishing sites were sampled during May 2022 (Table 1). All six (6) electrofishing sites correspond with a macroinvertebrate site.

Kick sampling for aquatic macroinvertebrates was conducted in accordance with the protocols from *Water Quality Monitoring Protocols Streams and Rivers* (PA DEP 2018) and *Sampling Protocols for Pennsylvania's Wadeable Streams* (PFBC 2011). Samples were then analyzed using the protocols from the *Assessment Methodology for Rivers and Streams* (PA DEP 2018). Assessment methodology uses several macroinvertebrate Indices of Biotic Integrity (IBI); such as Taxa Richness, EPT Taxa Richness, Becks Index, Hilsenhoff Biotic Index, Shannon Diversity and Percent Sensitive Individuals. Each index represents the relative health of the stream by measuring different aspects of macroinvertebrate biotic health. They are then standardized to compute the Aquatic Life Use (ALU) IBI score. The ALU is used to rate streams as impaired or unimpaired (PA DEP 2013). The unimpaired benchmark must be equal to or greater than 63 to qualify as attaining ALU. ALU is also computed two (2) ways, Small Freestone Stream (SFS) and Large Freestone Stream (LFS). Each IBI tests the ALU standardizations in a way that represents the change in macroinvertebrate communities between small streams and larger streams/small rivers. ALU scoring was not intended as a tool to be used within AMD affected streams. The metrics were designed to show effects on biota with industrial and agricultural pollution. Many macroinvertebrates in headwaters are naturally acid tolerant (Cooper and Wagner 1973) and genus level identification does not distinguish between the individual species that may give false positives. It is still a useful tool when describing AMD affected waters in the recovery process since most AMD streams either attain ALU or do not attain ALU by moderate to large margins.

Electrofishing was conducted using the protocols from *Sampling Protocols for Pennsylvania's Wadeable Streams* (PFBC 2011). Section VI – Fishes was updated in 2013. Electrofishing was completed using a Midwest Lakes Supply Xstream backpack electrofisher or a Midwest Lakes Supply Infinity Variable Volt Pulsator (VVP) mounted on a Recon tow barge. The Xstream backpack unit utilizes a two-probe active sampling method and the Infinity tow barge system uses a three-probe and boat active sampling method. All fish were collected, identified to species and enumerated. Currently an official IBI for fishes in Pennsylvania is under development; however, fish collection data is recorded and retained for future IBI calculations.

Habitat assessments were conducted at each macroinvertebrate site in accordance with *Sampling Protocols for Pennsylvania's Wadeable Streams* (PFBC 2011), which are similar to *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers: Periphyton, Benthic Macroinvertebrates, and Fish*, 2nd Edition (Barbour, et al. 1999). Habitat assessments are an important part of stream sampling because they provide valuable insight into possible secondary factors that impair a stream. The habitat assessment protocol evaluates ten (10) parameters, each measuring an aspect of instream or riparian zone habitats. As a tool, it allows surveyors to identify stressors to the local stream environment.

Results and Discussion

No survey site in the Aultman's Run watershed attained the ALU Benchmark of 63.00 or more. All sites surveyed had habitat impacts that will likely hinder their ability to attain ALU (Table 2). Habitat will likely be an issue throughout the watershed even after AMD and AML issues are mitigated. Site Altman's Run Vanwright Road (ARVR) had the highest potential for full restoration. This site also had the highest ALU, Habitat score, along with a large and diverse forage fish population.

Appendix

Table 1. Sampling Point Name, Abbreviation and Type of Sampling Completed at Each Point with Longitude and Latitude.

Sample Point Name	ID	Macro	Fish	Long (west)	Lat (North)	River Kilometer
Neal Run Headwaters	NRH	x	-	-79.2996	40.5786	2.45
Neal Run Mouth	NRM	x	x	-79.2909	40.5548	0.30
Reeds Run Upstream Neal Run	RRUSNR	x	x	-79.2907	40.5555	2.31
Reeds Run Bridge on Cunkleman Road	RRCR	x	x	-79.2825	40.5389	0.18
Aultman's Run Upstream Reeds Run	ARUSRR	x	x	-79.2776	40.5423	9.00
Aultman's Run Downstream Reeds Run	ARDSRR	x	x	-79.2875	40.5225	6.20
Aultman's Run at Bridge on Vanwright Road	ARVR	x	x	-79.2939	40.5005	3.20

Table 2. Habitat Assessment Parameters and Scores, Arranged from Headwater (Left) to Mouth and Receiving Water (Right), for Aultman's Run Biological Assessment taken May 2022.

Habitat Assessment Parameters	NRH	NRM	RRUSNR	RRCR	ARUSRR	ARDSRR	ARVR
Instream Cover	7	17	6	16	13	15	17
Epifaunal Substrate	5	18	7	12	10	14	16
Embeddedness	3	9	6	7	7	10	14
Velocity/Depth Regimes	4	11	7	16	14	15	17
Channel Alterations	10	9	7	11	15	14	15
Sediment Deposition	4	8	6	11	11	8	13
Frequency of Riffles	3	15	13	16	13	12	16
Channel Flow Status	17	17	17	16	17	17	17
Condition of Banks	12	12	12	16	9	6	13
Bank Vegetative Protection	11	5	6	14	12	12	14
Grazing or Other Disruptive Pressures	13	3	4	6	14	14	14
Riparian Vegetative Zone Width	15	3	3	3	16	17	14
Total	104	127	94	144	151	154	180

Table 3. Field Water Quality Measurements, Arranged from Headwater (Left) to Mouth and Receiving Water (Right), for Aultman's Run Biological Assessment taken May 2022.

Water Quality	NRH	NRM	RRUSNR	RRCR	ARUSRR	ARDSRR	ARVR
Temperature (°C)	7.0	7.1	7.6	7.2	7.9	8.9	8.3
pH	8.2	7.2	7.5	7.1	7.5	7.4	7.4
Specific Conductance (umhos)	103.5	231.0	263.2	341.0	268.4	330.4	317.4
Alkalinity (mg/L)	51.0	43.0	84.0	56.0	119.0	71.0	69.0

Table 4. Raw Macroinvertebrate Data for Neal Run Headwater (NRH) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Serratella	20
	Eurylophella	3
	Habrophlebia	8
	Acerpenna	4
	Baetis	16
Plecoptera	Cultus	3
	Amphinemura	69
	Haploperla	6
Trichoptera	Cheumatopsyche	2
	Hydropsyche	3
Diptera	Dixa	2
	Hexatoma	12
	Prosimulium	3
	Tipula	2
	Tabanus	9
	Bezzia	6
	Chironomidae	36
Coleoptera	Ectopria	1
	Oulimnius	2
Oligocheata	Oligocheata	2
Sum of all Individuals		209
Number sub-samples picked out of 24		4

Table 5. Macroinvertebrate IBI Scores, Arranged from Headwater (Left) to Mouth and Receiving Water (Right), for Aultman's Run Watershed taken May 2022.

Macroinvertebrate IBI Scores	NRH	NRM	RRUSNR	RRCR	ARUSRR	ARDSRR	ARVR
Taxa Richness	20	15	21	11	19	18	21
EPT Taxa Richness	6	4	7	5	8	8	8
Becks Index	9	6	11	7	9	8	8
Hilsenhoff Biotic Index	3.92	3.71	4.62	4.77	5.72	5.73	4.68
Shannon Diversity	2.29	2.31	2.38	2.03	1.37	2.04	2.33
Percent Sensitive PTV 0-3 Individuals	54.07	29.27	27.41	20	10.48	7.86	35

Tables 6A and 6B. IBI Standardizations and Aquatic Life Use (ALU) Benchmark, Arranged from Headwater (Left) to Mouth and Receiving Water (Right), for Aultman's Run watershed taken May 2022.

6A.

IBI Standardization and Aquatic Life Use Benchmark	NRH		NRM		RRUSNR		RRCR	
	SFS	LFS	SFS	LFS	SFS	LFS	SFS	LFS
Taxa Richness	0.61	0.65	0.45	0.48	0.64	0.68	0.33	0.35
EPT Taxa Richness PVT 0-4	0.32	0.38	0.21	0.25	0.37	0.44	0.26	0.31
Becks Index	0.24	0.41	0.16	0.27	0.29	0.50	0.18	0.32
Hilsenhoff Biotic Index	0.75	0.88	0.78	0.91	0.66	0.77	0.65	0.75
Shannon Diversity	0.80	0.80	0.81	0.81	0.83	0.83	0.71	0.71
Percent Sensitive PTV 0-3 Individuals (PSI)	0.64	0.81	0.35	0.44	0.32	0.41	0.24	0.30
ALU Benchmark	55.79	65.23	45.91	52.67	51.92	60.55	39.52	45.78

6B.

IBI Standardization and Aquatic Life Use Benchmark	ASUSRR		ASDSRR		ARVR	
	SFS	LFS	SFS	LFS	SFS	LFS
Taxa Richness	0.58	0.61	0.55	0.58	0.64	0.68
EPT Taxa Richness PVT 0-4	0.42	0.50	0.42	0.50	0.42	0.50
Becks Index	0.24	0.41	0.21	0.36	0.21	0.36
Hilsenhoff Biotic Index	0.53	0.62	0.53	0.61	0.66	0.77
Shannon Diversity	0.48	0.48	0.71	0.71	0.82	0.82
Percent Sensitive PTV 0-3 Individuals (PSI)	0.12	0.16	0.09	0.12	0.41	0.52
ALU Benchmark	39.42	46.24	41.84	48.18	52.58	60.80

Table 7. Raw Macroinvertebrate Data for Neal Run Mouth (NRM) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Rhithrogena	1
	Eurylophella	1
	Habrophlebiodes	1
	Caenis	1
Plecoptera	Haploperla	11
Trichoptera	Chimarra	2
	Hydropsyche	1
	Polycentropus	1
Diptera	Tipula	2
	Tabanus	1
	Chironomidae	2
	Probezzia	5
Coleoptera	Optioservus	5
	Gyrinus	1
	Stenelmis	6
Sum of all Individuals		41
Number Sub-samples picked out of 24		24

Table 8. Raw Fish Data for Neal Run Mouth (NRM) Sampled May 23, 2022.

Common Name	Number
Green Sunfish	1
Fantail Darter	2
White Sucker	3
Creek Chub	32
Blacknose Dace	2

Table 9. Raw Macroinvertebrate Data for Reeds Run Upstream Neal Run (RRUSNR) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Acerpenna	2
Plecoptera	Haploperla	10
	Sweltsa	1
	Isoperla	4
	Prosotia	1
	Amphinemura	6
	Strophopteryx	4
Trichoptera	Chimarra	2
	Hydropsyche	1
	Hydroptila	8
Diptera	Hexatoma	3
	Prosimulium	5
	Pseudolimnophila	2
	Dicranota	1
	Chironomidae	49
	Probezzia	6
Coleoptera	Optioservus	14
	Dubiraphia	7
	Stenelmis	5
Oligocheata	Oligocheata	3
Decapoda	Cambaridae	1
Sum of all Individuals		135
Number sub-samples picked out of 24		24

Table 10. Raw Fish Data for Reeds Run Upstream Neal Run (RRUSNR) Sampled May 23, 2022.

Common Name	Number
Fantail Darter	7
Johnny Darter	4
Yellow Bullhead	1
White Sucker	4
Creek Chub	125
Blacknose Dace	40
Bluntnose Minnow	1
Rosey Face Shiner	25

Table 11. Raw Macroinvertebrate Data for Reeds Run Cunkleman Road Bridge (RRCR) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Ameletus	1
	Ephemera	1
	Eurylophella	2
	Caenis	1
Plecoptera	Haploperla	2
	Amphinemura	2
Trichoptera	Hydropsyche	1
Diptera	Chironomidae	10
Coleoptera	Optioservus	3
	Stenelmis	6
Decapoda	Cambaridae	1
Sum of all Individuals		30
Number sub-samples picked out of 24		24

Table 12. Raw Fish Data for Reeds Run Cunkleman Road Bridge (RRCR) Sampled May 23, 2022.

Common Name	Number
Creek Chub	4

Table 13. Raw Macroinvertebrate Data for Aultman's Run Upstream Reeds Run (ARUSRR) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Ephemera	5
	Serratella	2
	Maccaffertium	6
	Eurylophella	2
	Baetis	1
Plecoptera	Haploperla	1
	Leuctra	2
	Amphinemura	4
Trichoptera	Chimarra	1
	Hydropsyche	7
	Hydroptila	4
Diptera	Hexatoma	1
	Antocha	1
	Chelifera	3
	Chironomidae	147
Coleoptera	Dubiraphia	1
	Stenelmis	13
Oligocheata	Oligocheata	8
Decapoda	Cambaridae	1
Sum of all Individuals		210
Number sub-samples picked out of 24		14

Table 14. Raw Fish Data for Aultman's Run Upstream Reeds Run (ARUSRR) Sampled May 24, 2022.

Common Name	Number
Green Sunfish	1
Fantail Darter	1
Johnny Darter	4
White Sucker	18
Northern Hog Sucker	1
Creek Chub	17
Blacknose Dace	9
Rosey Face Shiner	2

Table 15. Raw Macroinvertebrate Data for Aultman's Run Downstream Reeds Run (ARDSRR) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Ephemera	2
	Attenella	1
	Maccaffertium	10
	Stenacron	1
	Baetis	5
Plecoptera	Haploperla	2
	Leuctra	1
	Amphinemura	1
Trichoptera	Chimarra	4
	Cheumatopsyche	30
	Hydropsyche	52
Diptera	Antocha	1
	Chironomidae	36
	Probezzia	1
Coleoptera	Optioservus	8
	Dubiraphia	2
	Stenelmis	64
Nematoda	Nematoda	8
Sum of all Individuals		229
Number sub-samples picked out of 24		16

Table 16. Raw Fish Data for Aultman's Run Downstream Reeds Run (ARDSRR) Sampled May 24, 2022.

Common Name	Number
Green Sunfish	1
Fantail Darter	22
Johnny Darter	2
Rainbow Darter	17
White Sucker	11
Northern Hog Sucker	6
Creek Chub	22
Blacknose Dace	21
Longnose Dace	2
Bluntnose Minnow	2
Rosey Face Shiner	2
Silverjaw Minnow	1

Table 17. Raw Macroinvertebrate Data for Aultman's Run Vanwright Road Bridge (ARVR) Sampled May 4, 2022.

Taxa Group	Taxa ID Level	Number of Individuals
Ephemeroptera	Isonychia	7
	Maccaffertium	40
	Stenacron	3
	Stenonema	1
	Baetis	14
Plecoptera	Leuctra	7
	Soyedina	1
	Amphinemura	14
Trichoptera	Chimarra	40
	Cheumatopsyche	3
	Hydropsyche	20
Diptera	Prosimulium	4
	Antocha	1
	Dicranota	1
	Chironomidae	44
	Hemerodromia	1
Coleoptera	Stenelmis	1
Megaloptera	Nigronia	2
Odonata	Lanthus	1
Oligocheata	Oligocheata	14
Turbellaria	Planaria	1
Sum of all Individuals		220
Number sub-samples picked out of 24		14

Table 16. Raw Fish Data for Aultman's Run Vanwright Road Bridge (ARVR) Sampled May 24, 2022.

Common Name	Number
Bluegill	13
Fantail Darter	3
Greenside Darter	1
Johnny Darter	4
Rainbow Darter	8
White Sucker	14
Northern Hog Sucker	8
Mottled Sculpin	1
Creek Chub	12
Blacknose Dace	5
Longnose Dace	1
Bluntnose Minnow	3
Rosey Face Shiner	1

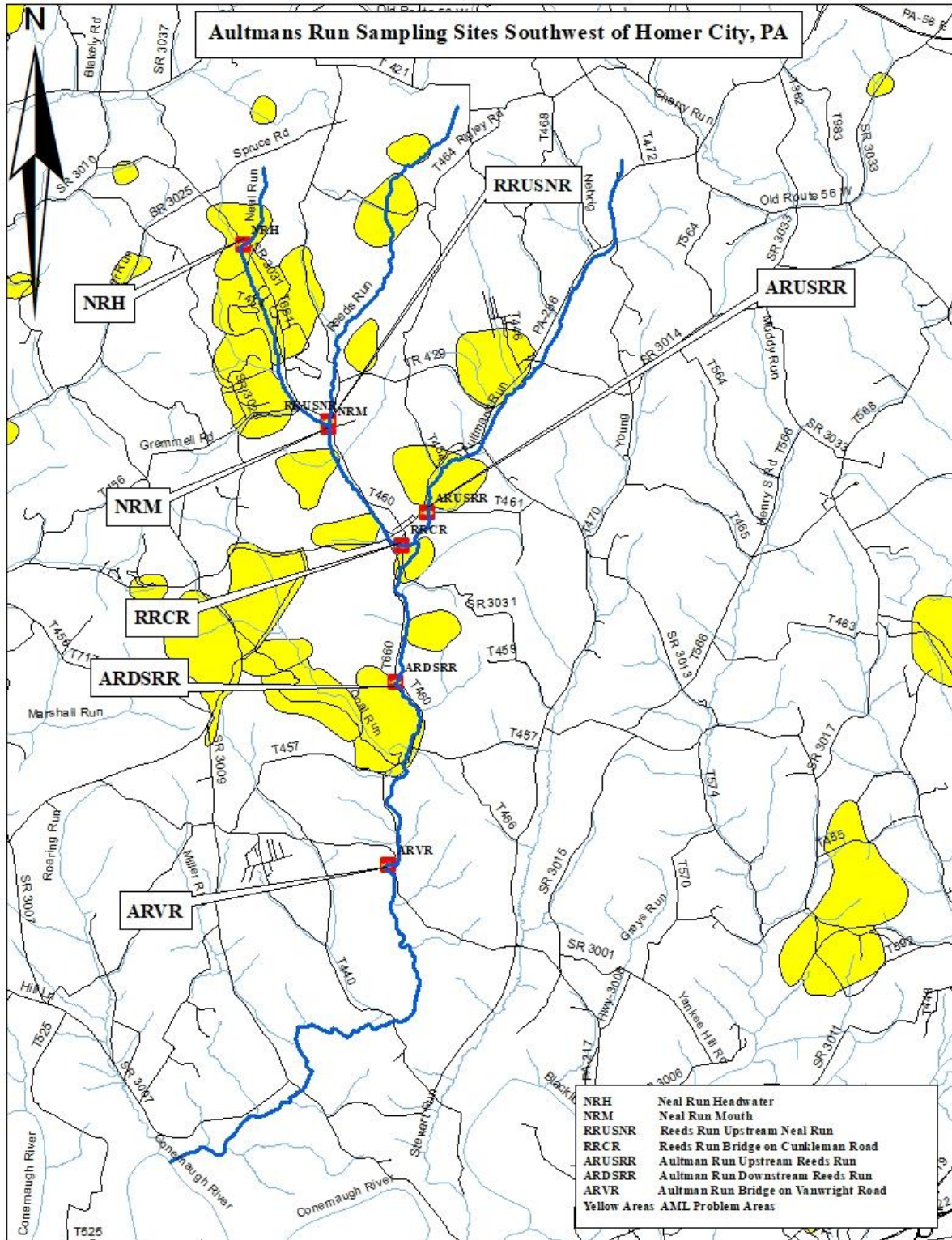


Figure 1. Map of Aultman's Run Sampling Points.

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