



Unassessed Waters Surveys in the Anderson Creek Watershed Clearfield County, PA

Technical Report Provided Through the Trout Unlimited AMD Technical Assistance Program

February 2013

Background

The Anderson Creek watershed is located in Clearfield County, Pennsylvania, near the towns of Curwensville and Grampian. A large portion of the western side of the Anderson Creek watershed has been impacted by abandoned mine drainage (see Figure 1). Anderson Creek is listed as a non-attaining stream (a stream that does not meet its designated use criteria as determined by the Pennsylvania Department of Environmental Protection) due to abandoned mine drainage from the mouth of Little Anderson Creek to its confluence with the West Branch Susquehanna River. A large portion of the streams within the watershed have not had formal fishery surveys completed. The Anderson Creek Watershed Association has requested technical assistance from Trout Unlimited to complete fishery surveys on the unassessed streams within the Anderson Creek watershed, as listed by the Pennsylvania Fish and Boat Commission (PFBC). Trout Unlimited completed fishery surveys on 15 tributaries to Anderson Creek that were previously listed as unassessed by the PFBC.

Methods

Data collection methods followed the “Sampling Procedures for Unassessed Trout Waters Sampled by non-PFBC Entities” (PFBC, 2010). Physical, chemical, and fishery data were collected at each stream that was surveyed. Latitude and longitude of the starting point for each survey were recorded in decimal degrees using a handheld GPS unit. Length measurements of the surveyed stream reach were measured using a hip chain. Site lengths were approximately 100 meters and ended at a natural break point to minimize fish movement out of the survey area. Width measurements (wetted width) were made approximately every 20 meters of the survey reach and 5 widths were recorded at each site and an average width for the site was later calculated.

Chemical data was also collected in the field and included the following parameters: time of day, water temperature (°C), pH (standard units), total alkalinity (mg/l), total hardness (mg/l), and specific conductance (umhos). All equipment was properly calibrated and EPA approved protocols were followed.

Fisheries data were collected using backpack electrofishing gear. Specifically, all surveys were completed using the Smith-Root, LR-24 backpack electrofisher. Pulsed DC was used at all sites. During electrofishing surveys, all salmonid species were collected and measured to the nearest millimeter. In addition, a subjective abundance (according to PFBC) was given to all non-game species found within each sample site. Biomass estimates were obtained using the Pennsylvania state mean weight for the length group of each trout captured.

Results

Kratzer Run

Kratzer Run is a tributary to Anderson Creek and flows along PA State Route 879. Kratzer Run is listed by the PA DEP as impaired by AMD from the headwaters to the mouth. Fishery surveys were completed on two different sections of Kratzer Run, as water quality was thought to improve upstream of Bilger Run. In addition, anecdotal information from locals suggested that trout may inhabit Kratzer Run upstream of the mouth of Bilger Run. The surveyed sections were located near the mouth of Kratzer Run (40.976316 N; -78.547267 W) and Kratzer Run upstream of Bilger Run (40.967816 N; -78.580608 W). Both sections were surveyed on 22 June 2011. The physical and chemical data for each survey site are given in Table 1. Fishery survey results are provided in Tables 2 and 3.

Table 1: Physical and chemical data for the two survey sites on Kratzer Run. Total alkalinity and total hardness were not measured at these sites.

Parameter	Kratzer Run – Mouth	Kratzer Upstream of Bilger Run
Site Length (m)	102	105
Mean Width (m)	6.5	4.14
Time of Day	10:00	10:45
Water Temp (°C)	17.4	15.5
pH	7.6	7.96
Total Alkalinity (mg/l)	N/A	N/A
Total Hardness (mg/l)	N/A	N/A
Spec. Cond. (umhos)	333	273

Table 2: Summary of trout catch and biomass data from electrofishing surveys **a)** near the mouth of Kratzer Run and **b)** Kratzer Run upstream of Bilger Run.

a)

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brook Trout	250	1	2.70	2.70
	TOTAL	1	2.7	2.7
Brown Trout	25	1	2.7	0.02
	250	1	2.7	2.75
	TOTAL	2	5.4	2.77

b)

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brown Trout	50	1	2	0.06
	150	2	4	2.03
	175	3	6	4.67
	200	1	2	2.25
	250	3	6	12.70
	275	3	6	16.48
	375	1	2	13.44
	TOTAL	14	28	51.63

Table 3: Species occurrence for each survey site on Kratzer Run.

Species Common Name	Kratzer Run – Mouth	Kratzer Run upstream of Bilger Run
Blacknose Dace	Not Present	Abundant
Black Crappie	Not Present	Rare
Tessellated Darter	Not Present	Rare
White Sucker	Not Present	Abundant
Fallfish	Present	Not Present
Brown Bullhead	Rare	Not Present
Common Shiner	Rare	Not Present
Bluegill	Present	Not Present

Bilger Run

Bilger Run is listed as impaired by AMD by the PA DEP. The land-use in the area surrounding Bilger Run is primarily forested. A fishery survey was completed at 40.992828N; -78.59095W on 22 June 2011. The survey site was 165 meters in length and the stream had a mean width of 5.84 meters. No trout or other fish species were found at this location during the survey. The physical and chemical data from the site are given in Table 4.

Table 4: Physical and chemical data for Bilger Run.

Parameter	Bilger Run
Site Length (m)	165
Mean Width (m)	5.84
Time of Day	13:39
Water Temp (°C)	16.2
pH	6.85
Total Alkalinity (mg/l)	10
Total Hardness (mg/l)	N/A
Spec. Cond. (umhos)	283

Bear Run

Bear Run is an entirely forested stream. There is a small impoundment along Bear Run that is maintained by the local water authority (Curwensville). There appears to be no AMD influencing this stream. Habitat appeared to be adequate for brook trout. Temperature may be a limiting factor downstream of the impoundment; however, this was not investigated. The fishery survey was completed upstream of the impoundment on 23 June 2011 (41.021812 N; -78.570624 W). A total of four brook trout were collected within the 162 meter reach. No other species were documented within the survey site. Physical and chemical data for the site are given in Table 5. A summary of the fishery survey are found in Table 6.

Table 5: Physical and chemical data for Bear Run.

Parameter	Bear Run
Site Length (m)	162
Mean Width (m)	4.2
Time of Day	9:30
Water Temp (°C)	13.7
pH	5.2
Total Alkalinity (mg/l)	20
Total Hardness (mg/l)	N/A
Spec. Cond. (umhos)	24.5

Table 6: Summary of trout catch and biomass data from electrofishing survey on Bear Run.

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brook Trout	100	2	4.76	0.40
	125	2	4.76	0.72
	TOTAL	4	9.52	1.12



Figure 1: Brook trout from Bear Run.

Irvin Branch

Irvin Branch is a small headwater stream that flows directly into Anderson Creek. There is no evidence of AMD in this area and the habitat appeared to be adequate for brook trout. Water quantity may be a limiting factor during low flows. However, at the time of the survey, the stream contained water. The land-use is entirely forested. A fishery survey was completed on 136 meters of the stream, beginning at the mouth (41.019054 N; -78.588969 W) on 23 June 2011. A total of two brook trout were collected within the survey site. No other fish species were present. Physical and chemical data for the site are given in Table 7. A summary of the fishery survey are found in Table 8. Figure 1 shows one of the brook trout captured during the survey.

Table 7: Physical and chemical data for Irvin Branch.

Parameter	Irvin Branch
Site Length (m)	136
Mean Width (m)	2.64
Time of Day	12:30
Water Temp (°C)	14.4
pH	5.3
Total Alkalinity (mg/l)	N/A
Total Hardness (mg/l)	N/A
Spec. Cond. (umhos)	30.3

Table 8: Summary of trout catch and biomass data from electrofishing survey on Irvin Branch.

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brook Trout	125	1	2.33	0.69
	275	1	2.33	6.41
	TOTAL	2	4.66	7.10

Panther Run

Panther Run is a tributary that flows into Anderson Creek from the eastern slope of the watershed. There is no evidence of AMD influencing the water quality of the stream. Land use is primarily forested. There are several small camps in this area and there was evidence of all-terrain vehicle trails through the stream. Habitat in this area was characterized by long, slow runs with few riffle areas. There was also moderate sedimentation in the area. A fishery survey was completed on 23 June 2011 at 41.050200 N; -78.627913 W. A total of two brook trout were collected from the 102 meter survey site. No other fish species were present at the site. Physical and chemical data for the site are given in Table 9. A summary of the fishery survey are found in Table 10.

Table 9: Physical and chemical data for Panther Run.

Parameter	Panther Run
Site Length (m)	102
Mean Width (m)	3.36
Time of Day	16:05
Water Temp (°C)	16.7
pH	5.82
Total Alkalinity (mg/l)	N/A
Total Hardness (mg/l)	N/A
Spec. Cond. (umhos)	37.5

Table 10: Summary of trout catch and biomass data from electrofishing survey on Panther Run.

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brook Trout	125	1	3.57	0.7
	225	1	3.57	3.77
	TOTAL	2	7.14	4.47

Montgomery Run

Montgomery Run drains in the Dubois Reservoir. The land-use is primarily forested. The site that was surveyed was near the headwaters of the stream, on Elk State Forest property (41.112410 N; -78.559196 W). In this area, water quantity may be a limiting factor during low flows, but this was not verified. A fishery survey was completed on 99 meters of the stream on 4 October 2011. No fish were observed during the survey, therefore stream widths were not measured. Crayfish (unidentified species) were observed during the survey. The survey site may be accessed off of Jury Mill road in the Elk State Forest. Physical and chemical data for the site are given in Table 11.

Table 11: Physical and chemical data for Montgomery Run.

Parameter	Montgomery Run
Site Length (m)	99
Mean Width (m)	N/A
Time of Day	13:30
Water Temp (°C)	12.0
pH	6.0
Total Alkalinity (mg/l)	10
Total Hardness (mg/l)	17.1
Spec. Cond. (umhos)	30.3

Blanchard Run

Blanchard Run is a tributary to Anderson Creek in the northern portion of the watershed. Blanchard Run flows alongside Interstate 80. This stream was dry when it was surveyed on 4 October 2011 at 41.121079 N; -78.616844 W.

Stony Run

Stony Run flows into Anderson Creek. Stony Run flows through the median of Interstate 80 for much of its length. Although the riparian area of the stream is forested, there are probably impacts from Interstate 80 on the habitat for brook trout. A fishery survey was completed on 4 October 2011 upstream of where the stream goes under Gordon Road (41.124649 N; -78.564852 W). The survey site was located upstream of UNT 26719 and Whitney Run. No trout were collected during the survey in this location. One blacknose dace was collected. Physical and chemical data for the site are given in Table 12.

Table 12: Physical and chemical data for Stony Run.

Parameter	Stony Run
Site Length (m)	55
Mean Width (m)	N/A
Time of Day	9:30
Water Temp (°C)	11.0
pH	7.87
Total Alkalinity (mg/l)	50
Total Hardness (mg/l)	51
Spec. Cond. (umhos)	198.9

UNT 26719 to Stony Run

A small, unnamed tributary flows into Stony Run near the survey site on Stony Run. This stream was surveyed for 75 meters from the mouth (41.124649 N; -78.564852 W) to where it flows under the west-bound lane of Interstate 80 on 4 October 2011. No fish were observed during the survey. Habitat was impacted by sedimentation in some areas and it also appeared that water quantity may be an issue for this stream during periods of low flow. Physical and chemical data for the site are given in Table 13.

Table 13: Physical and chemical data for UNT 26719 to Stony Run.

Parameter	UNT 26719
Site Length (m)	75
Mean Width (m)	N/A
Time of Day	10:00
Water Temp (°C)	10.8
pH	7.6
Total Alkalinity (mg/l)	30
Total Hardness (mg/l)	68.4
Spec. Cond. (umhos)	112.8

Whitney Run

Whitney Run is a tributary to Stony Run located in the northern portion of the Anderson Creek watershed. The land-use in the area is primarily forested. The survey site (41.137609 N; -78.572125 W) began upstream of where Gordon Road crosses the stream. A fishery survey was completed on 4 October 2011. No fish were observed during the survey and one crayfish (unidentified species) was observed. Physical and chemical data for the site are given in Table 14.

Table 14: Physical and chemical data for Whitney Run.

Parameter	Whitney Run
Site Length (m)	60
Mean Width (m)	N/A
Time of Day	8:30
Water Temp (°C)	10.9
pH	5.19
Total Alkalinity (mg/l)	10
Total Hardness (mg/l)	34
Spec. Cond. (umhos)	42.8

Little Anderson Creek (41.022841 N; -78.688758 W)

Little Anderson Creek is a tributary to Anderson Creek. The lower portion of Little Anderson Creek is impaired by AMD. Therefore, the survey site selected (41.022841 N; -78.688758 W) was located above the influence of the AMD. The land use in this area is primarily agriculture and some sedimentation issues were noted within the survey reach. A total of 87 meters was surveyed on 6 July 2012. No trout were collected during the survey. Other species observed included creek chub, blacknose dace, green sunfish, and pumpkin seed. Physical and chemical data are provided in Table 15.

Table 15: Physical and chemical data for Little Anderson Creek.

Parameter	Little Anderson Creek
Site Length (m)	87
Mean Width (m)	2.6
Time of Day	10:45
Water Temp (°C)	NA
pH	5.5
Total Alkalinity (mg/l)	27
Total Hardness (mg/l)	255
Spec. Cond. (umhos)	NA

Rock Run (41.051956 N; -78.657857 W)

Rock Run is a tributary to Little Anderson Creek. The stream was surveyed on 6 July 2012. Rock Run is listed by the PA DEP as impaired by AMD. During the site visit, sedimentation and iron precipitation were noted at the sample site, which was located at the mouth of the stream. Due to the AMD impairment, only 30 meters of the stream were surveyed. The portion of the site surveyed contained the most suitable habitat for fish. No fish were observed during the survey. Physical and chemical data are provided in Table 16.

Table 16: Physical and chemical data for Rock Run.

Parameter	Rock Run
Site Length (m)	30
Mean Width (m)	2.1
Time of Day	9:30
Water Temp (°C)	NA
pH	5.5
Total Alkalinity (mg/l)	0
Total Hardness (mg/l)	238
Spec. Cond. (umhos)	NA

Fenton Run (40.97802 N; -78.58731 W)

Fenton Run is a tributary to Bilger Run in the Anderson Creek watershed. The sample site (40.97802 N; -78.59372 W) was located approximately 110 meters below a gas well road crossing on Fenton Run. A 114 meter section of Fenton Run, beginning at the location stated above was surveyed on 21 August 2012. A total of 14 brook trout were collected during the survey. Creek chub was the only other species observed during the survey. The site appeared to have adequate habitat, including several pools. Some sedimentation was noted in the substrate as well as a potentially impassable culvert, which was located at the gas well road crossing (the upstream end of the survey site). Mean stream width for the survey section was 3.07 meters. Physical and chemical data are provided in Table 17. A summary of the fishery data is provided in Table 18.

Table 17: Physical and chemical data for Fenton Run.

Parameter	Fenton Run
Site Length (m)	114
Mean Width (m)	3.07
Time of Day	10:48
Water Temp (°C)	14.4
pH	6.47
Total Alkalinity (mg/l)	54
Total Hardness (mg/l)	306
Spec. Cond. (umhos)	499

Table 18: Summary of trout catch, catch per unit effort, and biomass for Fenton Run.

Species	Length Group (mm)	Number Captured	CPUE (hrs)	Biomass (kg/ha)
Brook Trout	50	7	28	0.48
	75	1	4	0.17
	125	1	4	0.69
	175	2	8	3.63
	200	2	8	5.24
	225	1	4	3.71
	TOTAL		14	56

Hughey Run (40.999592 N; -78.603272 W)

Hughey Run is a tributary to Bilger Run in the Anderson Creek watershed. The sample site (41.011067 N; -78.611293 W) was located near the bridge on TR 484. The stream in this area flows through a wetland area of abandoned mine land. No fishery survey was completed based on the water chemistry results. The stream is listed as impaired by AMD by the PA DEP. Physical and chemical data are provided in Table 19.

Table 19: Physical and chemical data for Hughey Run.

Parameter	Hughey Run
Site Length (m)	NA
Mean Width (m)	1.8
Time of Day	11:55
Water Temp (°C)	NA
pH	3.5
Total Alkalinity (mg/l)	<10
Total Hardness (mg/l)	257
Spec. Cond. (umhos)	NA