PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS
August 31, 2023

WATER: Black Creek (405D) Luzerne County

EXAMINED: August 2021

BY: A. Frey, G. Kratina, and J. Pacholec

Bureau Director Action:_____ Date:_____

Division Chief Action:_____ Date:_____

CW Unit Leader Action:_____ Date:_____

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AREA COMMENTS:

We surveyed 7 sites on Black Creek in 2021. The purpose of the survey was to determine if a fishery is present in the stream after decades of acid mine drainage and sewage pollution. A previous survey in 2011 documented limited fish populations and improving water quality. Both Brook Trout and Brown Trout were found in good numbers in 6 of the 7 survey sites.

AREA RECOMMENDATIONS:

1. Add Black Creek from the headwaters downstream to the mouth to the list of streams that support natural trout reproduction.

2. Re-survey Black Creek to further document the recovery of its wild trout populations.

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Pennsylvania Fish & Boat Commission
Bureau of Fisheries
Division of Fisheries Management

Black Creek (405D)
Fisheries Management Report

Prepared by:
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Date Sampled: August 2021 Date Prepared: December 2021

Introduction

Black Creek is a 35 km long tributary to Nescopeck Creek in Luzerne County (Figure 1). The Pennsylvania Fish and Boat Commission (PFBC) manages Black Creek as three separate sections. Section 01 extends 7.3 km from the headwaters downstream to SR 309. Section 02 extends 15.4 km from SR 309 downstream to SR 3020. Section 03 extends 12.2 km from SR 3020 downstream to the mouth. All three sections are under statewide angling regulations with no PFBC stocking. The Pennsylvania Department of Environmental Protection classifies the entire Black Creek watershed as Cold Water Fishes and Migratory Fishes in its Chapter 93 Water Quality Standards.

During the first fisheries survey of Black Creek, Wnuk et al. (1999) found severe degradation by acid mine drainage, permitted sewage discharges, combined sewer overflows, and litter. Water quality was toxic to fish life at most stations. Fish were present at a single station in Section 02 but gamefish were absent. Black Creek was re-surveyed in 2010 following angler reports of Brook Trout *Salvelinus fontinalis* catches (Wnuk and Frey 2011). Limited numbers of Brook Trout were caught however, it was not added to the wild trout list.

Methods

All procedures were carried out according to those outlined by Detar et al. (2011). Physical characteristics, physical-chemical values, and fish communities were examined. The fish communities were sampled using a backpack electrofishing unit. Wild trout were measured and recorded in 25 mm (1.0 inch) length groups. Statewide average weights calculated for each length group were used to

generate biomass estimates. Wild trout abundance and biomass estimates were determined from trout captured during a single electrofishing pass. Hatchery trout, identified by excessive fin wear and coloration, were excluded from abundance and biomass estimates. Scientific and common fish names reference the Integrated Taxonomic Information System (http://www.itis.gov).

This survey assessed 7 sampling stations (Table 1). Physical habitat evaluations followed the United States Environmental Protection Agency's Rapid Bioassessment Protocols for high gradient streams (Barbour et al. 1999). All chemical parameters were measured in the field using a colorimetric method for pH, a mixed indicator for total alkalinity, and EDTA titration for total hardness. We used backpack electrofishing gear to assess fish populations, Midwest Lake Electrofishing Systems unit (Model Infinity XStream.)

Results and Discussion

Black Creek Section 01

No samples were taken within Section 01. The stream was examined at the SR 940 bridge. The stream channel consisted almost entirely of dark colored substrate, likely coal fines. A few stagnant pools were present with very dark colored water. The Wnuk and Frey 2011 survey documented similar conditions where the pH was 4.8. Wnuk et al. (1999) reported that Section 01 was completely dry. Kupsky (1999) noted that the mapped headwaters of Black Creek no longer existed because strip mining had destroyed all natural contours.

Black Creek Section 02

We sampled three sites in Section 02 (Table 1). Total alkalinity ranged from 12 to 30 mg/l, total hardness was 51 at station 0203, pH ranged from 6.3 to 7.1, and specific conductance ranged from 309 to 365 µmhos (Table 2). Water quality values were slightly elevated compared to previous studies. Values are indicative of the historic coal mining and discharges that occur in the watershed. Total physical habitat scores at the three stations ranged 117 to 174 (suboptimal to optimal; Table 3). All stations were located in forested areas with partial shading of the stream channel. Substrate consisted of medium size rocks with gravel, sand, and silt with poor to low suboptimal levels of embeddedness. Fish species diversity generally increased from the 2011 survey (Table 4). Trout were absent at Station 0201. A pollution incident occurred near Station 0201 in June 2020 (Lupacchini 2020). Noted in the report was that several Brook Trout were observed among those killed. Wild Brook and Brown Trout were captured at both Station 0202 and 0203. Brook Trout ranged from 50 to 274 mm with biomass estimated at 2.19 and 2.75 km/ha (Table 5). Brown Trout

ranged from 75 to 474 mm with biomass estimated at 7.39 and 10.20 kg/ha.

Black Creek Section 03

We sampled four sites in Section 03. Total alkalinity ranged from 24 to 48 mg/l, total hardness ranged from 56 to 62 mg/l, pH ranged from 7.2 to 7.8, and specific conductance ranged from 351 to 440 µmhos. Similar to Section 02, Section 03 water quality values were elevated from the 2011 survey. The total physical habitat score ranged from suboptimal (148) to optimal (168). Riparian areas were mostly forested with partial shade of the stream channel. Substrates consisted of larger sizes than upstream areas with less embeddedness.

Fish species diversity and numbers greatly increased since 2011. Species richness increased from 3 species to 14 with wild trout were found at each Station. No fish were captured at Station 0301 in 2011 however, this site had the highest trout abundance of all the sites. Brook Trout ranged from 50 to 324 mm with biomass estimated from 0.55 to 4.35 km/ha (Table 6). Brown Trout ranged from 75 to 474 mm with biomass estimated at 7.65 and 46.47 kg/ha.

Summary and Management Comments

Water quality in Sections 02 and 03 of Black Creek is better than it has been in the recent past. Natural processes such as the depletion of iron pyrite from underground mine pools are the likely reasons for this improvement. Section 02 and 03 now supports natural reproduction of both Brook Trout and Brown Trout. Trout biomass exceeded Class A values at one site. Black Creek will be added to the list of streams that support natural trout reproduction.

MANAGEMENT RECOMMENDATIONS

1. Add Black Creek from the headwaters downstream to the mouth to the list of streams that support natural trout reproduction.

2. Re-survey Black Creek to further document the recovery of its wild trout populations.

LITERATURE CITED

Barbour, M., J. Gerritsen, B. Snyder, and J. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish, second edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

Detar, J., R. Wnuk, T. Greene, and M. Kaufmann. 2011. Standard electrofishing protocols for sampling wadeable streams. Pages 10 – 28 *in* D. Miko, editor. Sampling protocols for Pennsylvania's wadeable streams. Pennsylvania Fish and Boat Commission files, 595 E. Rolling Ridge Drive, Bellefonte, PA.

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Wnuk, R., and R. Moase, and L. Benzie. 1999. Nescopeck Creek Basin (405D) fisheries management report. Pennsylvania Fish and Boat Commission files, 595 E. Rolling Ridge Drive, Bellefonte, PA.

Wnuk, R., and A. Frey. 2011. Black Creek Basin (405D) fisheries management report. Pennsylvania Fish and Boat Commission files, 595 E. Rolling Ridge Drive, Bellefonte, PA.

Table 1. Station number, river mile, downstream limit, length electrofished, and voltage for stations sampled during 2021 in the Black Creek Basin (405D).

Stream	Station Number	River Mile	Downstream limit	Length (m)	Volts
Black Creek	0201	14.90	Jaycee Drive in industrial park	150	125 DC
	0202	11.71	Powerline crossing	300	125 AC
	0203	10.31	Bridge crossing	300	190 DC
	0301	7.09	300 m dnst private bridge	300	180 DC
	0302	4.07	Roadside pulloff	300	180 DC
	0303	3.00	T-314	310	185 DC
	0304	0.03	First bridge upst mouth	300	150 DC

Table 2. Physical-chemical data collected at sampling stations in the Black Creek Basin (405D) during 2021.

Stream	Station	Date	Water Temp. °C	pH	Total Alkalinity (mg/l)	Total Hardness (mg/l)	Specific Conductance (µmhos)
Black Creek	0201	8/13	21.3	6.3	12	NA	309
	0202	8/18	NA	NA	NA	NA	NA
	0203	8/13	21.6	7.1	30	51	365
	0301	8/11	22.6	7.8	48	58	440
	0302	8/11	19.7	7.2	34	62	351
	0303	8/10	20.6	7.4	24	58	393
	0304	8/10	20.9	7.4	24	56	380

NA = Not Available.

Table 3. Total physical habitat scores for streams sampled in the Black Creek Basin (405D) in 2021. All scores were determined using the method for high gradient sites.

Stream	Station	Total Physical Habitat Score
Black Creek	0201	117 (Suboptimal)
	0202	174 (Optimal)
	0203	133 (Suboptimal)
	0301	148 (Suboptimal)
	0302	168 (Optimal)
	0303	159 (Suboptimal-Optimal)
	0304	164 (Optimal)

Table 4. Scientific names, common names, and abundance ratings of fish species captured in Black Creek (405D) in 2021.

		Section 02			Section 03			
Scientific name	Common name	0201	0202	0203	0301	0302	0303	0304
Salvelinus fontinalis	Brook Trout		P	P	R	P	P	P
Salmo trutta	Brown Trout		P	C	C	C	C	C
	Brown Trout (Hatchery)							R
Lepomis macrochirus	Bluegill			P				
Lepomis gibbosus	Pumpkinseed			P			R	
Campostoma anomalum	Central Stoneroller							R
Luxilus cornutus	Common Shiner							R
Exoglossum maxillingua	Cutlips Monnow							P
Semotilus atromaculatus	Creek Chub	C	P	C				P
Nocomis micropogon	River Chub							P
Pimephales notatus	Bluntnose Minnow							P
Notropis rubellus	Rosyface Shiner							P
Rhinichthys atratulus	Blacknose Dace	C	P	C	C	C	C	C
Rhinichthys cataractae	Longnose Dace							R
Semotilus corporalis	Fallfish							P
Catostomus commersonii	White Sucker	C	P	C	P	P	C	C
	Total Species:	**3**	**5**	**7**	**4**	**4**	**5**	**13**

Abundance ratings (based on estimated number of individuals seen in 300 m of electrofishing): A = Abundant (> 100); C = Common (26 - 100); P = Present (3 - 25); R = Rare (< 3).

Table 5. Wild trout abundance estimate for Section 02 Black Creek (405D) determined in 2021.

Site	Length Group (mm)	Number Collected	Number/ Hectare	Number/ Kilometer	Kilograms/ Hectare
0202					
Brook Trout	100 – 124	1	3	3	0.04
	150 – 174	1	3	3	0.13
	175 – 199	2	6	7	0.41
	200 – 224	2	6	7	0.59
	225 – 249	1	3	3	0.42
	250 – 274	2	6	7	1.16
	Totals:	9	27	30	2.75
Brown Trout	100 – 124	2	6	7	0.09
	200 – 224	3	10	10	0.93
	225 – 249	2	6	7	0.87
	250 – 274	2	6	7	1.17
	300 – 324	1	3	3	0.97
	450 – 474	1	3	3	3.36
	Totals:	11	34	37	7.39
0203					
Brook Trout	50 – 74	2	6	7	0.02
	75 – 99	6	18	20	0.11
	150 – 174	1	3	3	0.12
	175 – 199	3	9	1	0.58
	200 – 224	2	6	7	0.56
	225 – 249	2	6	7	0.80
	Totals:	16	48	54	2.19
Brown Trout					
	75 – 99	11	33	37	0.21
	100 – 124	3	9	10	0.13
	125 – 149	1	3	3	0.08
	150 – 174	1	3	3	0.13
	175 – 199	2	6	7	0.41
	200 – 224	7	21	23	2.07
	225- -249	2	6	7	0.82
	250 – 274	3	9	10	1.66
	300 – 324	1	3	3	0.92
	325 – 349	1	3	3	1.16
	425 – 449	1	3	3	2.61
	Totals:	33	99	109	10.20

Table 6. Wild trout abundance estimate for Section 03 Black Creek (405D) determined in 2021.

Site	Length Group (mm)	Number Collected	Number/ Hectare	Number/ Kilometer	Kilograms/ Hectare
0301					
Brook Trout	250 - 274	1	4	3	0.79
	Totals:	1	4	3	0.79
Brown Trout	75 - 99	1	4	3	0.03
	100 - 124	10	44	33	0.63
	175 - 199	3	13	10	0.88
	200 - 224	2	9	7	0.85
	225 - 249	12	53	40	7.10
	250 - 274	6	26	20	4.79
	275 - 299	5	22	17	5.19
	300 - 324	9	39	30	11.97
	325 - 349	5	22	17	8.37
	350 - 374	1	4	3	2.07
	450 - 474	1	4	3	4.59
	Totals:	55	240	183	46.47
0302					
Brook Trout	75 - 99	1	3	3	0.02
	100 - 124	1	3	3	0.04
	125 - 149	2	5	7	0.13
	150 - 174	2	5	7	0.22
	175 - 199	3	8	10	0.51
	200 - 224	2	5	7	0.50
	225 - 249	4	11	13	1.41
	250 - 274	1	3	3	0.48
	Totals:	16	43	53	3.31
Brown Trout	75 - 99	5	13	17	0.08
	100 - 124	4	11	13	0.15
	125 - 149	1	3	3	0.07
	150 - 174	2	5	7	0.23
	175 - 199	4	11	13	0.72
	200 - 224	6	16	20	1.56
	225- -249	3	8	10	1.08
	250 - 274	3	8	10	1.46
	425 - 449	1	3	3	2.30
	Totals:	29	78	96	7.65

Table 6 (cont).

Site	Length Group (mm)	Number Collected	Number/ Hectare	Number/ Kilometer	Kilograms/ Hectare
0303					
Brook Trout	50 - 74	1	3	3	0.01
	75 - 99	2	5	6	0.03
	150 - 174	3	8	10	0.33
	175 - 199	1	3	3	0.17
	200 - 224	2	5	6	0.50
	225 - 249	4	11	13	1.42
	250 - 274	2	5	6	0.98
	300 - 324	1	3	3	0.91
	Totals:	16	43	50	4.35
Brown Trout	50 - 74	1	3	3	0.01
	75 - 99	4	11	13	0.07
	100 - 124	3	8	10	0.12
	150 - 174	2	5	6	0.24
	175 - 199	10	27	23	1.81
	200 - 224	7	19	23	1.83
	225 - 249	3	8	10	1.09
	250 - 274	3	8	10	1.48
	275 - 299	2	5	6	1.28
	300 - 324	4	11	13	3.28
	375 - 399	1	3	3	1.56
	Totals:	40	108	129	12.77
0304					
Brook Trout	75 - 99	1	3	3	0.02
	150 - 174	1	3	3	0.11
	175 - 199	1	3	3	0.17
	200 - 224	1	3	3	0.25
	Totals:	4	12	12	0.55
Brown Trout	75 - 99	2	5	7	0.03
	100 - 124	3	8	10	0.12
	150 - 174	3	8	10	0.35
	175 - 199	5	13	17	0.90
	200 - 224	5	13	17	1.31
	225 - 249	4	11	13	1.46
	275 - 299	1	3	3	0.64
	300 - 324	2	5	7	1.63
	325 - 349	4	11	13	4.12
	350 - 374	2	5	7	2.55
	375 - 399	1	3	3	1.56
	400 - 424	1	3	3	1.87
	425 - 449	1	3	3	2.31
	Totals:	34	91	113	18.85

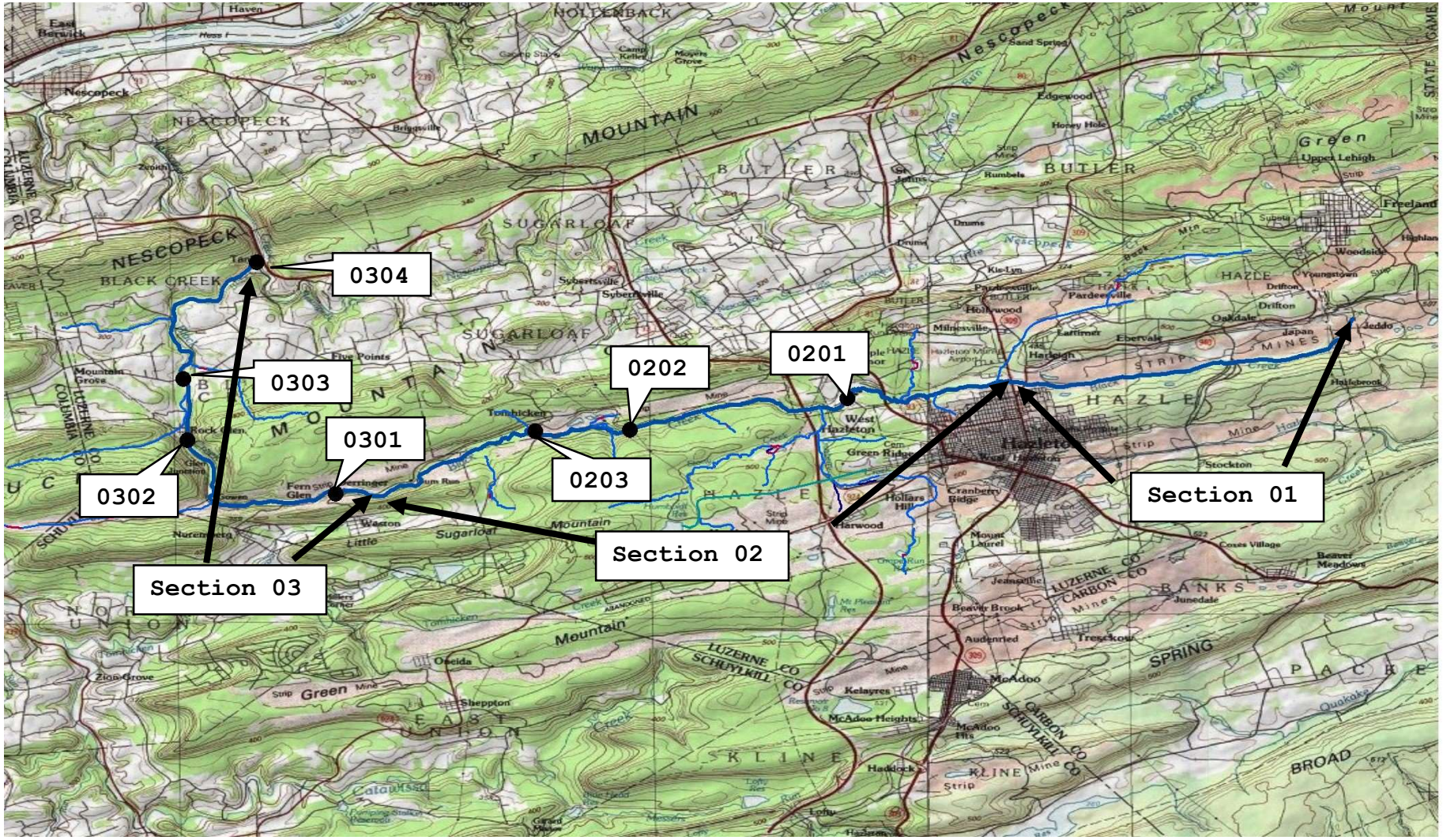

Figure 1. Black Creek drainage basin (405D).

DISTRIBUTION

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