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PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS

February 22, 2018

WATER: Fireline Creek (502B) Carbon County

EXAMINED: June 25, 2012

BY: Fisheries Management Area 5

Bureau Director Action: _____ Date: _____

Division Chief Action: _____ Date: _____

CW Unit Leader Action: _____ Date: _____

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AREA COMMENTS:

Section 01 of Fireline Creek supported natural reproduction of brown trout and brook trout. Rainbow trout fingerlings of unknown origin were also collected during sampling but upon further investigation a number of potential sources for these fish were identified that precluded our ability to conclusively attribute these fish to natural reproduction. Future survey work is scheduled for 2014 to better ascertain the origin of the rainbow trout fingerlings collected during the 2012 survey.

Section 01 of Fireline Creek extends from the headwaters downstream to the mouth. Three sample sites were examined (RM 2.58, 0.19 and 0.00) covering 14 percent of the section length. Wild brown trout and rainbow trout occurred at each sample site with brown trout being the dominant species. Brook trout were present in very low abundance at only the upstream site (RM 2.58). The average (three site mean) biomass was estimated at 49.22 kg/ha for brown trout and 3.40 kg/ha for rainbow trout. The average biomass for brown trout met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (>40.00 kg/ha) for a Class A wild brown trout population, as outlined in 58 PA Code §57.8a. Class A Wild Trout Streams. However, there was some question as to the origin of the rainbow trout captured during the survey which warrants additional survey information before classifying this section of stream as a Class A wild rainbow trout water.

The average biomass from site RM 2.58 and RM 0.19 was 72.88 kg/ha for brown trout and 4.77 kg/ha for rainbow trout. Whereas at site RM 0.00 the estimated biomass was 1.93 kg/ha for brown trout and 0.65 kg/ha for rainbow trout. The drastic change in biomass downstream of RM 0.19 was due to severely degraded stream habitat in the river flood plain at site RM 0.00. This was documented in the low RBP value of 105 for the site.

Only young-of-the-year rainbow trout were present in Fireline Creek. Their origin is unknown, as they may have resulted from a variety of sources including, natural reproduction from stocked adult trout immigrating from the Lehigh River, immigration of a portion of the approximately 7,000 - 10,000 PFBC stocked rainbow trout fingerlings that were stocked within the Lehigh River, Section 07, near the confluence with Fireline Creek on May 18, 2012, and/or the successful reproduction of adult rainbow trout caught by local

anglers and transferred to Fireline Creek (as reported by local landowners). In terms of length frequency distribution, rainbow trout from the 50 mm length group accounted for 94 percent (493 trout/km) of the estimated rainbow trout abundance at site RM 2.58. In contrast, rainbow trout from the 100 mm length group accounted for 84 percent (81 trout/km) of the estimated abundance at site RM 0.19 and 68 percent (13 trout/km) of the estimated abundance at site RM 0.00. The surveys were conducted at least one month after the PFBC fingerling rainbow trout were stocked in the Lehigh River, Section 07. These trout ranged between 100 and 149 mm in length at the time of stocking. Based on an estimated average growth rate of one mm per day, these trout should have ranged between 125 and 174 mm in length at the time of the surveys on June 25, 2012.

The information above suggests that the rainbow trout present in Fireline Creek may have resulted from natural reproduction and not from immigration of PFBC stocked fingerling trout. Rainbow trout reproduction in Fireline Creek is contingent upon the presence of adult rainbow trout during the spring spawning period. However, no adult rainbow trout were captured at any of the three sample sites during this examination. Based on the existing information, it is recommended that this water should be reinventoried to confirm the status of the rainbow trout population prior to recommending any Commission action with regard to this species.

The current 25 PA Code Chapter 93 Water Quality Standards listing of Cold Water Fishes, Migratory Fishes (CWF, MF) for the Fireline Creek basin does not adequately protect the existing flora and fauna present within the basin. Due to the presence of a Class A wild brown trout population in Section 01, the 25 PA Code Chapter 93 Water Quality Standards designation should be upgraded to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF). Furthermore, this stream qualified for placement on the list of stream sections that support wild trout based on the presence of two or more age groups of wild trout, as outlined in 58 PA Code §57.11., Listing of Wild Trout Streams. This further protects the trout population, particularly from additional potential impacts from within the headwater region.

AREA RECOMMENDATIONS:

1. Submit Fireline Creek (502B), Section 01, to be officially added to the Commission's Class A Wild Trout Waters list for brown trout.
2. Submit Fireline Creek (502B), Section 01, to be officially added to the list of stream sections that support natural reproduction of trout.
3. Submit Fireline Creek (502B), Section 01, to upgrade it's Chapter 93 water quality designation from Cold Water Fishes, Migratory Fishes (CWF, MF) to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF)
4. Resurvey Section 01 of Fireline Creek by 2014 to monitor the status of the rainbow trout population.
5. Continue to manage Fireline Creek (502B), Section 01, under Commonwealth Inland Waters regulations.

This work made possible by funding from the Sport Fish Restoration Act Project F-57-R Fisheries Management.

**PENNSYLVANIA FISH & BOAT COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION**

Fireline Creek (502B)
Section 01
Fisheries Management Report
Unassessed Water

Prepared by
David A. Arnold and Bryan B. Chikotas

Fisheries Management Database Name: Fireline Creek
Lat/Lon: 40°47'50"/75°39'59"

Date Sampled: June 25, 2012

Date Prepared: October 25, 2012

Introduction

Fireline Creek is a small stream located in Carbon County and flows south westerly into the Lehigh River at River Mile (RM) 39.78, 40°47'50" latitude and 75°39'59" longitude. The stream has a total length of 7.06 km (4.39 mi) and a drainage area of 9.7 km² (3.75 mi²). The current 25 PA Code Chapter 93 Water Quality Standards designation for Fireline Creek is Cold Water Fishes, Migratory Fishes (CWF, MF). Fireline Creek can be found on the Lehighon, PA United States Geological Survey 7.5 minute quadrangle (Figure 1).

Fireline Creek was surveyed as part of the Unassessed Waters Program to gather baseline information on the resource for management purposes and to verify and document the presence of a reproducing population of trout. Numerous residents indicated that a few local anglers have occasionally caught adult trout and kept them alive to stock in the creek. The exact species and origin is unknown, nor are the numbers or the times per year or even years this activity might have occurred. The reason for doing so was to establish a self-sustaining population of trout. Knowledge of the presence of wild trout in streams is important in the proper permitting of land use activities and in the long-term restoration projects such as the Eastern Brook Trout Joint Venture. The riparian land along Fireline Creek is a mixture of forested to shrub covered banks to manicured lawns and fields upstream of Bowmanstown, above and in the town it is bordered by Fireline Road and on the opposite bank by manicured lawns and small forested areas. In the lower 0.20 miles the stream drops sharply down a 20 degree cement culvert (approximately 20 m long) to the river plain, this area is highly disturbed from high velocity flows from storm events. Fireline Creek is managed under Commonwealth Inland Waters regulations. It is not an Approved Trout Water, nor is it located

downstream of an Approved Trout Water. Therefore, extended season regulations do not apply to this water.

Methods

The examination of Fireline Creek was conducted on June 25, 2012. All procedures were carried out according to those outlined by Weber et al. (2011). Three sampling stations (RM 2.58, 0.19 and 0.00) were chosen to be representative of Section 01 covering a total of 14 percent of the section length. An additional sampling station was established at RM 1.51 for the purpose of collecting water chemistry data.

Physical characteristics, physical-chemical values, and fish communities were examined. Rapid bioassessment protocols (RBP) were used to assess the habitat in this stream (Barbour et al. 1999). The fish communities were sampled using an electrobackpack equipped with an Appalachian Aquatics Model AA-24 variable voltage electrofisher set at 100 volts AC-Alternating Current (Battery Backpack). 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 the biomass estimate. All trout were given an identifying upper caudal fin clip during the initial electrofishing pass to facilitate a mark-recapture population estimate with trout densities determined by using the Chapman modification of the Petersen estimator or M+C-R when R was less than three. Scientific and common fish names reference Integrated Taxonomic Information System (<http://www.itis.gov>).

Results

Site River Mile: 2.58

Sample site RM 2.58 was located 545 meters downstream of the Unnamed tributary located upstream from the T-360 (Spring Road) Bridge at the intersection with T-370 (Hemlock Drive), 40°48'58" latitude and 75°38'29" longitude. The 369 m long station averaged 2.8 m in width (Table 1). This portion of the stream primarily flowed through a manicured lawn setting on the west stream bank with some small dense forested and/or shrub covered areas acting as a break between private properties, where as the east bank abutted Hemlock Drive. Numerous residential homes had bridge crossings. It is a small shallow stream with predominantly riffle and run habitat with occasional pools, especially downstream of bridge culvert crossings. Beyond the residential lawns the stream was overgrown and densely shaded. Bank erosion was moderate and the stream substrate consisted primarily of rubble, gravel and sand, with an occasional boulder. The RBP analysis yielded a final score of 148, which reflects sub-optimal conditions (Table 2).

Physical-chemical parameters and their associated values measured under near normal flow conditions were as follows: air temperature 17.5°C, water temperature 15.9°C, specific conductance 70 umhos, pH

6.9 standard units, and total alkalinity 12 mg/l (Table 3). These results indicate that the stream is suitable for salmonids.

Four fish species were captured at the site, including wild brown trout *Salmo trutta*, rainbow trout *Oncorhynchus mykiss*, and wild and hatchery brook trout *Salvelinus fontinalis*. The other species captured was blacknose dace *Rhinichthys atratulus*. Species composition included fish common to a cold to cool water environment, with the cold water species being the most prevalent (Table 4).

Brown Trout

Sixty-five wild brown trout ranging from 50 mm to 374 mm in total length (TL) were captured during the survey with 42 (65 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 71.29 kg/ha. Brown trout abundance was estimated at 214 trout/km (345 trout/mi) with 125 trout/km (201 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Sixteen wild brook trout ranging from 50 mm to 249 mm in total length (TL) were captured during the survey with 13 (81 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brook trout biomass was estimated to be 11.52 kg/ha. Brook trout abundance was estimated at 44 trout/km (71 trout/mi) with 36 trout/km (58 trout/mi) being of legal length or longer (Table 6). One brook trout of hatchery origin within the 250 mm length group was captured at site RM 2.58.

Rainbow Trout

Seventy-two rainbow trout ranging from 50 mm to 124 mm in total length (TL) were captured during the survey with none being greater than or equal to the legal harvestable length (175 mm: 7 in). Total rainbow trout biomass was estimated to be 5.80 kg/ha. Rainbow trout abundance was estimated at 523 trout/km (842 trout/mi) with no trout being of legal length or longer (Table 7).

Site River Mile: 1.51

Only water chemistry data was collected at this site. Physical-chemical parameters and their associated values measured under near normal flow conditions were as follows: air temperature 18.0°C, water temperature 14.9°C, specific conductance 90 umhos, pH 7.1 standard units, and total alkalinity 24 mg/l (Table 3). These results indicate that the stream is suitable for salmonids.

Site River Mile: 0.19

Sample site RM 0.19 was located at the upstream side of the railroad culvert located 311 meters upstream of the mouth, 40°48'00" latitude and 75°39'57" longitude. The 322 m long station

averaged 3.6 m in width (Table 1). This portion of the stream flowed through Bowmanstown with Fireline Road bordering the west stream bank which was partially tree and or low shrub lined, and near the downstream third of the site the stream channel was maintained by a rock wall bank. The east bank consisted of manicured lawns with some trees and low shrubs shading the stream and the lower third of the site also had a rock wall retaining the bank. Bank erosion was light to moderate in the upper two-thirds of the site, and minimal to light in the lower third which was protected by the rock wall, although it was deteriorating in some areas. The stream substrate consisted primarily of rubble, gravel with some boulders and small bedrock areas. Riparian conditions were degraded in Bowmanstown and in close proximity to Fireline Road and residential properties; otherwise instream habitat consisted of large boulders that created complex flow patterns and habitat niches suitable for fish within the reach.

The RBP analysis yielded a final score of 131, which categorizes the habitat within this reach as sub-optimal (110 - 159, Table 2).

Physical-chemical parameters were not taken at this site.

Eight fish species were captured at the site, including wild brown trout and rainbow trout. The other species captured are listed in Table 4. Species composition included fish common to a cold to cool water environment, with the cold water species being the most prevalent.

Brown Trout

Two hundred and fifteen wild brown trout ranging from 50 mm to 349 mm in total length (TL) were captured during the survey with 49 (23 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 74.46 kg/ha. Brown trout abundance was estimated at 1279 trout/km (2059 trout/mi) with 170 trout/km (274 trout/mi) being of legal length or longer (Table 5).

Rainbow Trout

Twenty-five rainbow trout ranging from 75 mm to 149 mm in total length (TL) were captured during the survey with none being greater than or equal to the legal harvestable length (175 mm: 7 in). Total rainbow trout biomass was estimated to be 3.73 kg/ha. Rainbow trout abundance was estimated at 96 trout/km (155 trout/mi) with no trout being of legal length or longer (Table 7).

Site River Mile: 0.00

Sample site RM 0.00 was located at the mouth, extending upstream to the downstream end of the cement culvert, 40°47'50" latitude and 75°39'59" longitude. The 311 m long station averaged 4.2 m in width (Table 1). This portion of the stream primarily flowed through a region interspersed with tree and low shrubs providing partial

shading. Bank erosion was heavy at the upstream end and tapered off proceeding downstream as the volume of water spread out and the velocity declined. The stream substrate consisted primarily of gravel, rubble and sand. The majority of the reach consisted of shallow riffles and runs with few pools. The habitat to hold larger fish was very poor. The upper end of the stream channel was contained within three culverts corresponding with Bank Street, SR 0248/0145, and the railroad, respectively. Erosion was severe in some places and in general cover for fish was lacking. The RBP analysis yielded a final score of 105, which places this reach at the upper end of the poor range (Table 2).

Physical-chemical parameters and their associated values measured under near normal flow conditions on June 19, 2012 were as follows: air temperature 19.6°C, water temperature 15.4°C, pH 7.0 standard units, total alkalinity 44 mg/l, and total hardness 60 mg/l (Table 3). These results indicate that the stream is suitable for salmonids.

Thirteen fish species were captured at the site, including wild brown trout and rainbow trout. The other species captured are listed in Table 4. Species composition included fish common to a cold to warm water environment, with the cold water species being the most prevalent. American eel were captured at this site including, one pencil eel, five medium size eels, and one large eel.

Brown Trout

Twenty-seven wild brown trout ranging from 50 mm to 249 mm in total length (TL) were captured during the survey with one (four percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 1.93 kg/ha. Brown trout abundance was estimated at 93 trout/km (150 trout/mi) with three trout/km (five trout/mi) being of legal length or longer (Table 5).

Rainbow Trout

Six rainbow trout ranging from 50 mm to 149 mm in total length (TL) were captured during the survey with none being greater than or equal to the legal harvestable length (175 mm: 7 in). Total rainbow trout biomass was estimated to be 0.65 kg/ha. Rainbow trout abundance was estimated at 19 trout/km (31 trout/mi) with no trout being of legal length or longer (Table 7).

Discussion

Section 01 of Fireline Creek supported natural reproduction of brown trout, brook trout and rainbow trout. Section 01 extends from the headwaters downstream to the mouth. Three sample sites were examined (RM 2.58, 0.19 and 0.00) covering 14 percent of the section length. Wild brown trout and rainbow trout occurred at each

sample site with brown trout being the dominant species. Brook trout were present in very low abundance at only the upstream site (RM 2.58). The average (three site mean) biomass was estimated at 49.22 kg/ha for brown trout and 3.40 kg/ha for rainbow trout. The average biomass for brown trout met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (≥ 40.00 kg/ha) for a Class A wild brown trout population, as outlined in 58 PA Code §57.8a. Class A Wild Trout Streams. However, there was some question as to the origin of the rainbow trout captured during the survey which warrants additional survey information before classifying this section of stream as a Class A wild rainbow trout water.

The average biomass from site RM 2.58 and RM 0.19 was 72.88 kg/ha for brown trout and 4.77 kg/ha for rainbow trout. At site RM 0.00 the estimated biomass was 1.93 kg/ha for brown trout and 0.65 kg/ha for rainbow trout. The drastic change in biomass downstream of RM 0.19 was due to severely degraded stream habitat in the river flood plain at site RM 0.00. This was documented in the low RBP value of 105 for the site.

Only young-of-the-year rainbow trout were present in Fireline Creek. Their origin is unknown, as they may have resulted from a variety of sources including, natural reproduction from stocked adult trout immigrating from the Lehigh River, immigration of a portion of the approximately 7,000 - 10,000 PFBC stocked rainbow trout fingerlings that were stocked within the Lehigh River, Section 07, near the confluence with Fireline Creek on May 18, 2012, and/or the successful reproduction of adult rainbow trout caught by local anglers and transferred to Fireline Creek (as reported by local landowners). In terms of length frequency distribution, rainbow trout from the 50 mm length group accounted for 94 percent (493 trout/km) of the estimated rainbow trout abundance at site RM 2.58. In contrast, rainbow trout from the 100 mm length group were accounted for 84 percent (81 trout/km) of the estimated abundance at site RM 0.19 and 68 percent (13 trout/km) of the estimated abundance at site RM 0.00. The surveys were conducted at least one month after the PFBC fingerling rainbow trout were stocked in the Lehigh River, Section 07. These trout ranged between 100 and 149 mm in length at the time of stocking. Based on an estimated average growth rate of one mm per day, these trout should have ranged between 125 and 174 mm in length at the time of the surveys on June 25, 2012.

The information above suggests that the rainbow trout present in Fireline Creek may have resulted from natural reproduction and not from immigration of PFBC stocked fingerling trout. Rainbow trout reproduction in Fireline Creek is contingent upon the presence of adult rainbow trout during the spring spawning period. However, no adult rainbow trout were captured at any of the three sample sites during this examination. Based on the existing information it is recommended that this water should be reinventoried to confirm the status of the rainbow trout population prior to recommending any Commission action with regard to this species.

The current 25 PA Code Chapter 93 Water Quality Standards listing of Cold Water Fishes, Migratory Fishes (CWF, MF) for the Fireline Creek basin does not adequately protect the existing flora and fauna present within the basin. Due to the presence of a Class A wild brown trout population in Section 01, the 25 PA Code Chapter 93 Water Quality Standards designation should be upgraded to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF). Furthermore, this stream qualified for placement on the list of stream sections that support wild trout based on the presence of two or more age groups of wild trout, as outlined in 58 PA Code §57.11., Listing of Wild Trout Streams. This further protects the trout population, particularly from additional potential impacts from within the headwater region.

Management Recommendations

1. Submit Fireline Creek, (502B), Section 01, to be officially added to the Commission's Class A Wild Trout Waters list for brown trout.
2. Submit Fireline Creek (502B), Section 01, to be officially added to the list of stream sections that support natural reproduction of trout.
3. Submit Fireline Creek (502B), Section 01, to upgrade it's Chapter 93 water quality designation from Cold Water Fishes, Migratory Fishes (CWF, MF) to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF).
4. Resurvey Section 01 of Fireline Creek by 2014 to monitor the status of the rainbow trout population.
5. Continue to manage Fireline Creek (502B), Section 01, under Commonwealth Inland Waters regulations.

Literature Cited

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and Rivers. USEPA. Report 814-99-002 Washington, DC.
- Weber, R., R. T. Greene, and D. Miko. 2011. Protocols for conducting biological assessments of unassessed trout waters. Pages 95-101 in D. Miko, editor. Sampling protocols for Pennsylvania's wadeable streams. Pennsylvania Fish and Boat Commission. Harrisburg, PA.

Table 1. Fireline Creek (502B), Carbon County. Site sampling location, length surveyed, average site width and site area.

Site Date	River mile	Downstream limit description	Length (m)	Ave. Width (m)	Site Area (ha)
6/25/2012	2.58	545 meters downstream of the Unnamed tributary located upstream from T-360 (Spring Road) Bridge at the intersection with T-370 (Hemlock Drive)	369	2.8	0.10
6/25/2012	0.19	Upstream side of railroad culvert located 311 meters upstream from the mouth	322	3.6	0.12
6/25/2012	0.00	Mouth, extending upstream to end of culvert. American eel counts: pencil =1, medium=5, large=1	311	4.2	0.13

Table 2. High Gradient Rapid Bioassessment Protocol ratings for Fireline Creek (502B), Carbon County, conducted at site RM 2.58 and RM 0.19 on June 25, 2012, and site RM 0.00 on June 19, 2012.

RM 2.58				
Habitat Parameter	Score	Habitat Parameter	Score	
Epifaunal Substrate / Available Cover	14	Left Bank Stability	7	
Embeddedness	17	Right Bank Stability	7	
Velocity / Depth Regime	15	Left Bank Vegetative Protection	8	
Sediment Deposition	16	Right Bank Vegetative Protection	8	
Channel Flow Status	17	Left Bank Riparian Vegetative Width	5	
Channel Alteration	13	Right Bank Riparian Vegetative Width	5	
Frequency of Riffles or bends	16	Total Score		148
RM 0.19				
Epifaunal Substrate / Available Cover	16	Left Bank Stability	5	
Embeddedness	17	Right Bank Stability	5	
Velocity / Depth Regime	18	Left Bank Vegetative Protection	4	
Sediment Deposition	15	Right Bank Vegetative Protection	4	
Channel Flow Status	15	Left Bank Riparian Vegetative Width	2	
Channel Alteration	10	Right Bank Riparian Vegetative Width	2	
Frequency of Riffles or bends	18	Total Score		131
RM 0.00				
Epifaunal Substrate / Available Cover	10	Left Bank Stability	5	
Embeddedness	11	Right Bank Stability	5	
Velocity / Depth Regime	16	Left Bank Vegetative Protection	6	
Sediment Deposition	8	Right Bank Vegetative Protection	6	
Channel Flow Status	15	Left Bank Riparian Vegetative Width	1	
Channel Alteration	5	Right Bank Riparian Vegetative Width	1	
Frequency of Riffles or bends	16	Total Score		105

Table 3. Chemistries collected in Fireline Creek (502B), Carbon County. Sample site(s) are within Section 01 in 2012 sample year.

Site RM	0.00	1.51	2.58
Sample Date	06/19/2012	06/19/2012	06/25/2012
Time (24 hour)	1000	1109	1245
Air Temperature (C)	19.6	18.0	17.5
pH Field Colorimetric (SU)	7.0	7.1	6.9
Specific Conductance (UMHOS)		90	70
Total Alkalinity Field Mixed Indicator (MG/L)	44	24	12
Total Hardness Field EDTA (MG/L)	60		
Water Temperature (C)	15.4	14.9	15.9

Table 4. Fish species occurrence from Fireline Creek (502B), Carbon County, at site RM 2.58, RM 0.19 and RM 0.00 on June 25, 2012.

Common Name	Scientific Name	RM 2.58	RM 0.19	RM 0.00
American Eel	<i>Anguilla rostrata</i>	-	X	-
Blacknose Dace	<i>Rhinichthys atratulus</i>	X	X	X
Bluegill	<i>Lepomis macrochirus</i>	-	-	X
Brook Trout	<i>Salvelinus fontinalis</i>	X	-	-
Brook Trout - Hatchery	<i>Salvelinus fontinalis</i>	X	-	-
Brown Bullhead	<i>Ameiurus nebulosus</i>	-	-	X
Brown Trout	<i>Salmo trutta</i>	X	X	X
Creek Chub	<i>Semotilus atromaculatus</i>	-	-	X
Cutlips Minnow	<i>Exoglossum maxillingua</i>	-	X	X
Fallfish	<i>Semotilus corporalis</i>	-	X	X
Green Sunfish	<i>Lepomis cyanellus</i>	-	-	X
Longnose Dace	<i>Rhinichthys cataractae</i>	-	X	X
Margined Madtom	<i>Noturus insignis</i>	-	-	X
Rainbow Trout	<i>Oncorhynchus mykiss</i>	X	X	X
Tessellated Darter	<i>Etheostoma olmstedii</i>	-	X	X
White Sucker	<i>Catostomus commersonii</i>	-	-	X

Table 5. Wild brown trout Petersen abundance and biomass estimates at site RM 2.58, RM 0.19 and RM 0.00 on Fireline Creek (502B), Carbon County, on June 25, 2012.

RM 2.58						
Size Group	Estimate	Low95CI	High95CI	NumHa	KgHa	NumKm
50	6			58	0.15	16
75	25	10	62	242	1.55	68
100	2			19	0.28	5
175	6			58	3.90	16
200	17	9	35	165	15.98	46
225	2			19	2.61	5
250	12	7	25	116	21.19	33
275	5	2	13	48	11.47	14
300	2			19	5.88	5
325	1			10	3.70	3
350	1			10	4.58	3
Totals	79			764	71.29	214
RM 0.19						
50	105	47	263	906	2.29	326
75	233	147	388	2010	12.85	724
100	8			69	0.99	25
150	11	5	24	95	4.16	34
175	31	19	53	267	17.97	96
200	3			26	2.51	9
225	8	4	21	69	9.31	25
250	10	5	23	86	15.74	31
275	1			9	2.04	3
325	2			17	6.60	6
Totals	412			3554	74.46	1279
RM 0.00						
50	16			123	0.31	51
75	12	5	30	92	0.59	39
225	1			8	1.03	3
Totals	29			223	1.93	93
Section Average				1512	49.22	529

Table 6. Wild brook trout Petersen abundance and biomass estimates at site RM 2.58 on Fireline Creek (502B), Carbon County, on June 25, 2012.

Size Group	Estimate	low95CI	High95CI	NumHa	KgHa	NumKm
50	1			10	0.02	3
75	2			19	0.12	5
175	5			48	3.10	14
200	5			48	4.48	14
225	3			29	3.80	8
Totals	16			154	11.52	44
Section Average				51	3.84	16

Table 7. Rainbow Trout Petersen abundance and biomass estimates at site RM 2.58, RM 0.19 and RM 0.00 on Fireline Creek (502B), Carbon County, on June 25, 2012.

RM 2.58						
Size Group	Estimate	Low95CI	High95CI	NumHa	KgHa	NumKm
50	182	86	420	1762	4.83	493
75	7			68	0.43	19
100	4			39	0.54	11
Totals	193			1869	5.80	523
RM 0.19						
75	3			26	0.16	9
100	26	14	55	224	3.12	81
125	2			17	0.45	6
Totals	31			267	3.73	96
RM 0.00						
50	1			8	0.02	3
100	4			31	0.43	13
125	1			8	0.20	3
Totals	6			47	0.65	19
Section Average				727	3.40	212

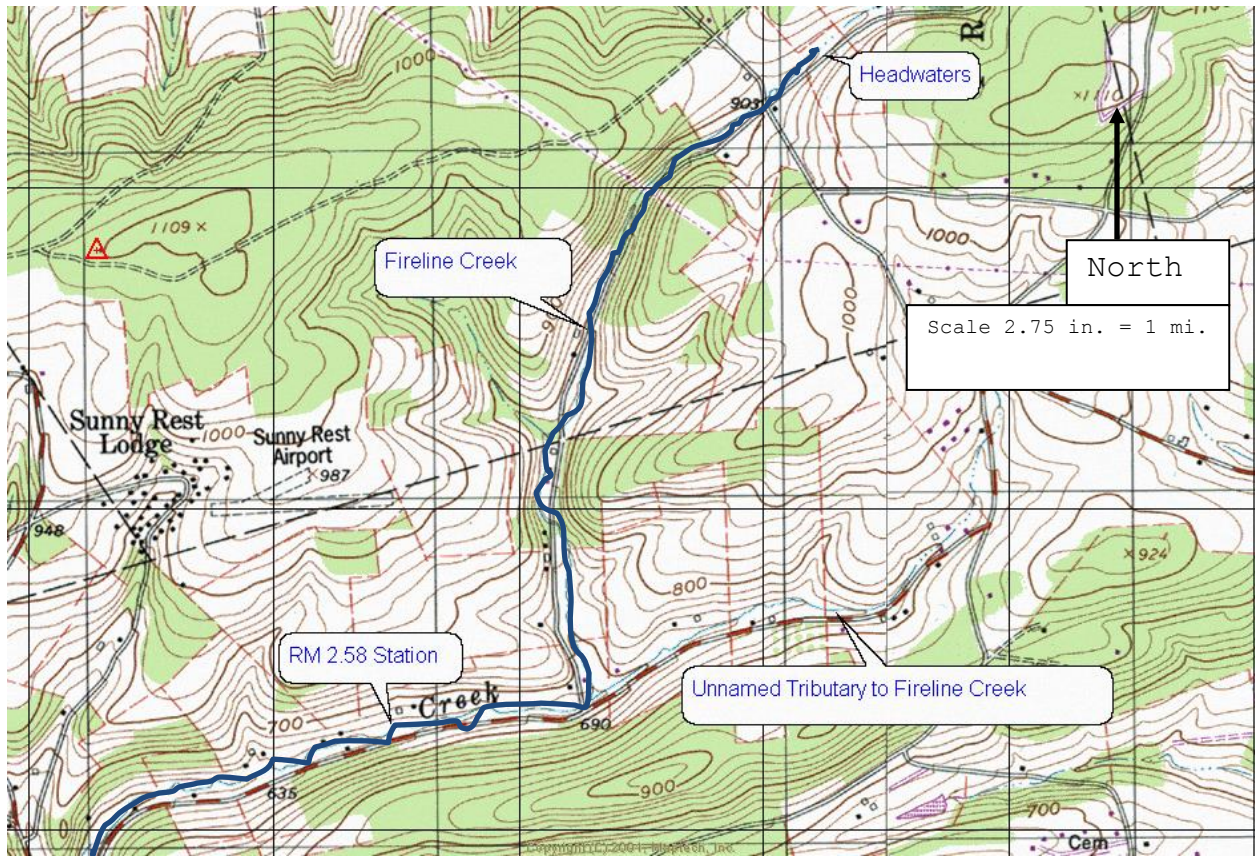


Figure 1. Fireline Creek (502B), Section 01, and site surveyed on June 25, 2012, in Carbon County, Pennsylvania, USGS Lehigh PA, 7.5 minute quadrangle.

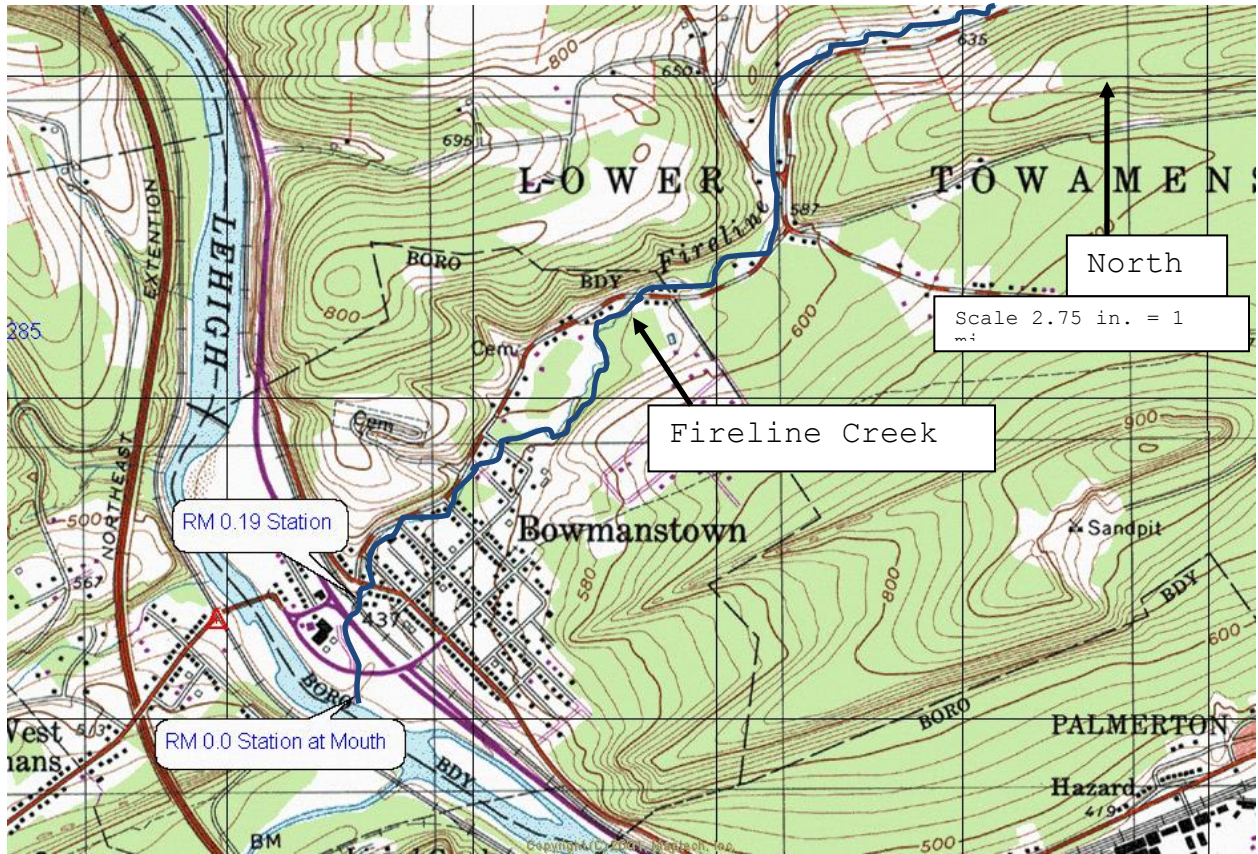


Figure 1. (continued) Fireline Creek (502B), Section 01, and sites surveyed on June 19 and 25, 2012, in Carbon County, Pennsylvania, USGS Lehigh PA, 7.5 minute quadrangle.