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DEP Stream Code: 03788 **PA FISH AND BOAT COMMISSION** Hunter Creek

COMMENTS AND RECOMMENDATIONS

February 16, 2012

WATER: Hunter Creek (502B) Carbon County

EXAMINED: August 12-14, 2009

BY: Fisheries Management Area 5 – Arnold, Chikotas, Vernoski

Bureau Director Action: _____Date: _____

Division Chief Action: _____Date: _____

CW Unit Leader Action: _____Date: _____

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AREA COMMENTS:

Section 01 of Hunter Creek supported natural reproduction of brown trout and brook trout, with brown trout being the dominant species accounting for 97 percent (56.56 of 58.17 kg/ha) of the total trout biomass. The brown trout density determined from the survey exceeded the Pennsylvania Fish and Boat Commission's minimum biomass criteria of greater than or equal to 40.00 kg/ha for consideration as a Class A population.

The current 25 PA Code Chapter 93 water quality standards listing of Cold Water Fishes, Migratory Fishes as applied to Hunter Creek via Buchwha Creek Basin does not adequately protect the existing flora and fauna present within the Hunter Creek basin. Adequate protection for this stream based on the Class A brown trout population is at least High Quality Cold Water Fishes, Migratory Fishes (HQ-CWF, MF). Hunter Creek is listed in the PFBC's list of stream sections that support natural reproduction of trout.

AREA RECOMMENDATIONS:

1. Hunter Creek, 502B, Section 01, Carbon County, should be added to the PFBC Class A waters list.

2. Due to the presence of a Class A brown trout population, the water quality designation of Hunter Creek, Section 01 (headwaters downstream to the mouth) should be upgraded and listed in its own right as High Quality-Cold Water Fishes, Migratory Fishes , in lieu of the Cold Water Fishes, Migratory Fishes designation awarded via the Buckwha Creek Basin.

3. Resurvey as the Area 5 and Fisheries Management Division operational schedule permits by 2018.

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

Hunter Creek (502B)
Section 01
Fisheries Management Report

Prepared by
David A. Arnold

Fisheries Management Database Name: Hunter Creek
Lat/Lon: 40°49'54"/75°31'19"

Date Sampled: August 12-14, 2009 Date Prepared: April 28, 2010

Introduction

Hunter Creek is located in Carbon County and is a 10 km (6.21 mi) long tributary to Buckwha Creek at River Mile (RM) 0.6, 40°49'54" latitude and 75°31'19" longitude. This stream has a drainage area of 24 km^2 (9.27 mi^2) and flows northeast to its confluence with Buckwha Creek. The current water quality designation of Hunter Creek as applied through the Buchwha Creek Basin is Cold Water Fishes, Migratory Fishes (CWF, MF), and is listed by the PFBC as a stream section that supports natural reproduction of trout. Hunter Creek can be found on the Palmerton, PA United States Geological Survey 7.5 minute quadrangle.

Billingsley and Bourke (1978) surveyed Section 02 of Hunter Creek on July 21, 1978, at RM 0.00 and RM 1.60. A total of 12 and 10 brown trout were caught at RM 1.60 and 0.00, and their sizes ranged from 50 to 274 mm and 75 to 299 mm, respectively. No brook trout were caught during this survey. Three hatchery rainbow trout were caught at RM 0.00. Section 02 extended from the confluence with an Unnamed Tributary at the intersection of SR 2011 and T-425 at RM 2.90 downstream to the mouth. At this time, Section 02 was managed as an approved trout water.

Due to an increase in the amount of landowner posting and a reduction in the amount of public parking, Hunter Creek, Section 02, was removed from the adult trout stocking program prior to the 2002 season. Subsequently, the stream was resectioned to reflect one management section (Section 01) extending from the headwaters downstream to the mouth.

In 2009, Hunter Creek was surveyed as part of a statewide assessment of 4th order streams tentatively identified as possible warmwater streams.

Methods

The examination of Hunter Creek was conducted from August 12-14, 2009. All procedures were carried out according to those outlined by Marcinko et al. (1986). Three representative sampling stations totaling nine percent of the section length was sampled in Section 01.

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 a Appalachian Aquatics Model AA-24 variable voltage electrofisher set at 150 volts AC-Alternating Current (Battery Backpack). Wild trout were measured and recorded in 25 mm (1.0 in) length groups. Statewide average weights calculated for each length group were used to generate the biomass estimate. Wild trout were given an identifying upper caudal fin clip during the initial electrofishing pass to facilitate a mark-recapture population estimate. Trout densities were determined using the Chapman modification of the Petersen estimator or M+C-R when R was less than three. Scientific and common fish names reference the Integrated Taxonomic Information System (http://www.itis.gov).

Results

Site River Mile: 3.47

Sampling site RM 3.47 was located 319 meters downstream Strohls Valley Road (T-433) Bridge, 40°51’57” latitude and 75°32’40” longitude. The 319 m long station averaged 3.4 m in width and comprised three percent of the total section length (Table 1). This portion of the stream primarily flowed through an open forested bank interspersed with a few homes. Bank erosion was light and the stream substrate consisted primarily of rubble, cobble and gravel. The RBP analysis yielded a final score of 159 (Table 2).

Physical-chemical parameters and their associated values measured under normal flow conditions were as follows: air temperature 24.4°C, water temperature 17.8°C, specific conductance 121 umhos, pH 7.2 standard units, and total alkalinity 22 mg/l (Table 3).

Ten fish species were collected at the site, including brown trout *Salmo trutta* and brook trout *Salvelinus fontinalis*. Species composition included fish common to a cold to warmwater environment. Fish common to a coldwater environment were the most prevalent (Table 4).

Brown Trout

One hundred thirty wild brown trout ranging in length from 50 mm to 424 mm total length (TL) were collected during the survey. Fifty two (40 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 77.41 kg/ha. Brown trout abundance was estimated at 645 trout/km (1,038 trout/mi) with 175 trout/km (282 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Thirteen wild brook trout ranging in length from 50 mm to 249 mm total length (TL) were collected during the survey. Five (38 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brook trout biomass was estimated to be 4.79 kg/ha. Brook trout abundance was estimated at 39 trout/km (63 trout/mi) with 15 trout/km (24 trout/mi) being of legal length or longer (Table 6).

Site River Mile: 1.60

Sampling site RM 1.6 was located 200 m upstream Summer Mountain Road, 40°50'39" latitude and 75°32'29" longitude. The 302 m long station averaged 6.1 m in width and comprised three percent of the total section length (Table 1). This portion of the stream primarily flowed through a forested reach of steam. Bank erosion was light and the stream substrate consisted primarily of rubble, cobble, and gravel. The RBP analysis yielded a final score of 160 (Table 2).

Physical-chemical parameters and their associated values measured under normal flow conditions were as follows: air temperature 24.4°C, water temperature 17.9°C, specific conductance 111 umhos, pH 7.1 standard units, and total alkalinity 20 mg/l (Table 3).

Ten fish species were collected at the site, including brown trout and brook trout. Species composition included fish common to a cold to warmwater environment. Fish common to a coldwater environment were the most prevalent (Table 4).

Brown Trout

One hundred thirty wild brown trout ranging in length from 50 mm to 449 mm total length (TL) were collected during the survey. Thirty seven (28 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 35.55 kg/ha. Brown trout abundance was estimated at 749 trout/km (1,206 trout/mi) with 136 trout/km (219 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Two sublegal (< 175 mm, 7 in) wild brook trout ranging in length from 75 mm to 149 mm total length (TL) were collected during the survey. Total brook trout biomass was estimated to be 0.19 kg/ha.

Site River Mile: 0.01

Sampling site RM 0.01 was located 25 m upstream from its confluence with Buckwha Creek, 40°49'54" latitude and 75°31'20" longitude. The 300 m long station averaged 7.3 m in width and comprised three percent of the total section length (Table 1). This portion of the stream primarily flowed through a forested reach with some homes. Bank erosion was light and the stream substrate consisted primarily of rubble, cobble and gravel. The RBP analysis yielded a final score of 138 (Table 2).

Physical-chemical parameters and their associated values measured under normal flow conditions were as follows: air temperature 22.7°C, water temperature 17.7°C, specific conductance 117 umhos, pH 7.1 standard units, and total alkalinity 26 mg/l (Table 3).

Nine fish species were collected at the site, including brown trout. Species composition included fish common to a cold to warmwater environment. Fish common to a coldwater environment were the most prevalent (Table 4).

Brown Trout

One hundred twenty two wild brown trout ranging in length from 50 mm to 349 mm total length (TL) were collected during the survey. Fifty eight (48 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 56.79 kg/ha. Brown trout abundance was estimated at 507 trout/km (816 trout/mi) with 244 trout/km (393 trout/mi) being of legal length or longer (Table 5).

Brook Trout

No wild brook trout were present at this site.

Discussion

Section 01 of Hunter Creek supported natural reproduction of brown trout and brook trout, with brown trout being the dominant species accounting for 97 percent (56.57 of 58.23 kg/ha) of the total trout biomass. The wild brown trout density determined from the survey exceeded the Pennsylvania Fish and Boat Commission's minimum biomass criteria of greater than or equal to 40.00 kg/ha for consideration as a Class A wild brown trout population.

The current 25 PA Code Chapter 93 water quality standards listing of Cold Water Fishes, Migratory Fishes as applied to Hunter Creek via the Buchwha Creek Basin does not adequately protect the existing flora and fauna present within the Hunter Creek basin. Adequate protection for this stream based on the Class A wild brown trout population is at least High Quality-Cold Water Fishes, Migratory Fishes (HQ-CWF, MF). Hunter Creek is already listed in the PFBC’s list of stream sections that support natural reproduction of trout.

Management Recommendations

1. Hunter Creek, 502B, Section 01, Carbon County, should be added to the PFBC Class A waters list.

2. Due to the presence of a Class A brown trout population, the water quality designation of Hunter Creek, Section 01 (headwaters downstream to the mouth) be upgraded and listed in its own right as High Quality-Cold Water Fishes, Migratory Fishes, in lieu of the Cold Water Fishes, Migratory Fishes designation awarded via the Buckwha Creek Basin.

3. Resurvey as the Area 5 and Fisheries Management Division operational schedule permits by 2018.

Literature Cited

Billingsley, C.T., and Bourke, D.E., 1978, Stream Examination Report on Hunter Creek, 502B, Section, PFBC Files, 450 Robinson Lane, Bellefonte, PA.

Barbour, et al., 1999, Rapid Bioassessment Protocols in Use in Wadeable Streams and Rivers, 2nd Ed, EPA, Office of Water, 4503F, Washington, DC 20460, EPA 841-B-99-002, www.epa,gov/OWOW/monitoring/techmon.html

Marcinko, M., R. Lorson and R. Hoopes. 1986. Procedures for Stream and River Inventory Information Input. Pennsylvania Fish and Boat Commission, 450 Robinson Lane, Bellefonte, PA.

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

Site Date	Rivermile	Downstream limit description	Length (m)	Ave. Width (m)	Site Area (ha)
8/14/2009	3.47	319 meters downstream Strohls Valley Road Bridge (T-433)	319	3.4	0.11
8/12/2009	1.60	200 meters upstream Summer Mountain Road	302	6.1	0.18
8/12/2009	0.01	25 meters upstream mouth.	300	7.3	0.22

Table 2. High Gradient Rapid Bioassessment Protocol ratings Hunter Creek (502B), Section 01, Carbon County conducted at RM 3.47, 1.60 and 0.01 on 12 and 14 August, 2009.

RM 3.47			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	18	Left Bank Stability	7
Embeddedness	15	Right Bank Stability	7
Velocity / Depth Regime	17	Left Bank Vegetative Protection	8
Sediment Deposition	11	Right Bank Vegetative Protection	8
Channel Flow Status	20	Left Bank Riparian Vegetative Width	8
Channel Alteration	13	Right Bank Riparian Vegetative Width	8
Frequency of Riffles or bends	19	**Total Score**	**159**
RM 1.60			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	12	Left Bank Stability	9
Embeddedness	11	Right Bank Stability	9
Velocity / Depth Regime	16	Left Bank Vegetative Protection	9
Sediment Deposition	13	Right Bank Vegetative Protection	9
Channel Flow Status	20	Left Bank Riparian Vegetative Width	8
Channel Alteration	15	Right Bank Riparian Vegetative Width	9
Frequency of Riffles or bends	20	**Total Score**	**160**
RM 0.01			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	14	Left Bank Stability	9
Embeddedness	13	Right Bank Stability	9
Velocity / Depth Regime	17	Left Bank Vegetative Protection	4
Sediment Deposition	18	Right Bank Vegetative Protection	4
Channel Flow Status	20	Left Bank Riparian Vegetative Width	1
Channel Alteration	9	Right Bank Riparian Vegetative Width	1
Frequency of Riffles or bends	19	**Total Score**	**138**

Table 3. Chemistries collected in Hunter Creek (502B), Carbon County. Sample site(s) are within Section 01 in 2009.

Parameter	Site 1	Site 2	Site 3
Site RM	0.01	1.60	3.47
Sample Date	08/12/2009	08/12/2009	08/14/2009
Time (24 hour)	930	1205	1112
Air Temperature (C)	22.7	24.4	24.4
pH Field Colorimetric (SU)	7.1	7.1	7.2
Specific Conductance (UMHOS)	117.0	111.0	121.0
Total Alkalinity Field Mixed Indicator (MG/L)	26	20	22
Water Temperature (C)	17.7	17.9	17.8

Table 4. Fish species occurrence Hunter Creek (502B), Section 01, Carbon County, sample sites RM 3.47, 1.60 and 0.01 on August 12-14, 2009.

Common Name	Scientific Name	RM 3.47	RM 1.60	RM 0.01
American Eel	*Anguilla rostrata*	X	X	X
Blacknose Dace	*Rhinichthys atratulus*	X	X	X
Brook Trout	*Salvelinus fontinalis*	X	X	-
Brown Trout	*Salmo trutta*	X	X	X
Brown Trout – Hatchery	*Salmo trutta*	-	-	X
Common Shiner	*Luxilus cornutus*	X		X
Creek Chub	*Semotilus atromaculatus*	X	-	X
Cutlip Minnow	*Exoglossum maxillingua*	-	X	X
Fallfish	*Semotilus corporalis*	X	X	-
Longnose Dace	*Rhinichthys cataractae*	-	X	-
Pumpkinseed	*Lepomis gibbosus*	X	X	-
Shield Darter	*Percina peltata*	-	-	X
Tessellated Darter	*Etheostoma olmstedi*	X	X	X
White Sucker	*Catostomus commersonii*	X	X	X

Table 5. Wild Brown Trout abundance and biomass estimate collected at sample sites RM 3.47. 1.60 and 0.01 on Hunter Creek (502B), Section 01, Carbon County, collected August 12-14, 2009.

RM 3.47						
Size Group	Estimate	low95CI	High95CI	NumHa	KgHa	NumKm
50	11			101	0.34	34
75	116	57	253	1069	8.66	364
100	18	8	44	166	1.91	56
150	5			46	2.29	16
175	21	12	40	194	14.71	66
200	18	11	33	166	18.73	56
225	10	5	22	92	13.38	31
250	5			46	8.06	16
300	1			9	2.92	3
400	1			9	6.41	3
Totals	206			1898	77.41	645
RM 1.60						
50	2			11	0.04	7
75	164	93	316	890	5.79	543
100	12			65	0.70	40
150	7	3	18	38	1.81	23
175	22	13	40	119	7.85	73
200	9	4	22	49	4.51	30
225	4			22	3.24	13
250	2			11	2.06	7
275	2			11	2.54	7
325	1			5	2.29	3
425	1			5	4.72	3
Totals	226			1226	35.55	749
RM 0.01						
50	4			18	0.05	13
75	38			174	1.02	127
100	4			18	0.19	13
150	33	13	81	151	6.80	110
175	20	9	50	91	5.99	67
200	9	4	22	41	3.80	30
225	20	8	49	91	12.95	67
250	12	5	30	55	10.38	40
275	6	3	16	27	6.41	20
300	3			14	3.41	10
325	3			14	5.79	10
Totals	152			694	56.79	507

Table 6. Wild brook trout abundance and biomass estimate collected at sample site HC 3.47 on Hunter Creek (502B), Carbon County collected August 14, 2009.

Size Group	Estimate	low95CI	High95CI	NumHa	KgHa	NumKm
50	3			28	0.06	9
75	2			18	0.07	6
100	3			28	0.33	9
175	2			18	1.24	6
200	2			18	1.80	6
225	1			9	1.29	3
Totals	13			119	4.79	39

DEP Stream Code: 03788 Hunter Creek

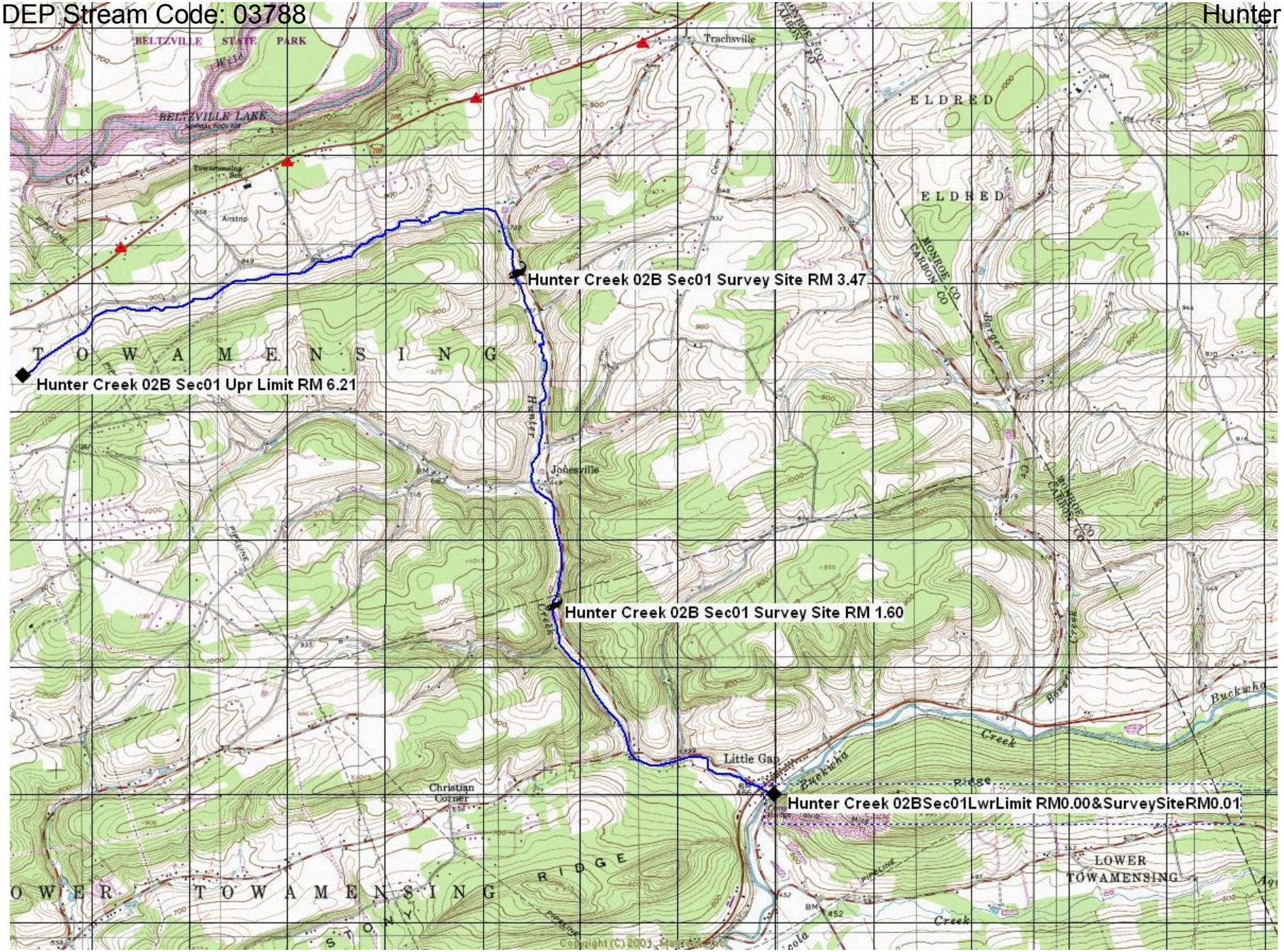

Figure 1. Location map for sample sites river mile 3.47, 1.60, and 0.01 on Hunter Creek (502B), Section 01, Carbon County, USGS 7.5 min. Topographic Map – Palmerton, PA Quadrangle.