

Distribution

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Northampton County Conservation District
14 Gracedale Ave. - Greystone Building
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February 16, 2012

WATER: Martins Creek (501F) Northampton County

EXAMINED: August 09, 2010

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 04 of Martins Creek supported natural reproduction of brown trout. The average brown trout biomass density in 2010 in Section 04 was 174.19 kg/ha. The density of brown trout at each site (RM 1.70 - 288.94 kg/ha; RM 0.60 - 59.44 kg/ha) met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (≥ 40.00 kg/ha) for a Class A wild brown trout population.

As noted above, the very high density of wild brown trout is attributable to the habitat present at RM 1.70, which is atypical for this reach of stream. The habitat present at RM 0.60 without the influence of the dam and its impacted area downstream is more representative of the stream habitat and carrying capacity. However, what site RM 1.70 does show is the potential of this stream with the proper habitat in place. Therefore, this section should be assessed by the Division of Habitat Management for potential work as long as it remains open to the public.

Section 03 of Martins Creek is stocked with rainbow trout fingerlings in addition to adult trout (rainbow trout only since 2008). All of the rainbow trout caught in Section 04 (RM 1.70, N=3; RM 0.60, N=6) were of adult hatchery origin based on the presence of fin deformities typically present in adult stocked trout but not in fingerling trout.

The current 25 PA Code Chapter 93 Water Quality Standards listing of Trout Stocking, Migratory Fishes (TSF, MF) for this section of Martins Creek, and perhaps upstream in the Martins Creek basin does not adequately protect the existing flora and fauna present within the basin. Based on the presence of a Class A wild brown trout population, it is recommend that the water quality designation of Section 04, and perhaps the upstream drainage as well (to ensure that Section 04 is protected from upstream influences), be upgraded to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF).

AREA RECOMMENDATIONS:

1. Submit Section 04 of Martins Creek to the Board of Commissioners for consideration as a Class A wild brown trout water.
2. Upgrade the Chapter 93 water quality designation from Trout Stocking, Migratory Fishes (TSF, MF) to High Quality - Cold Water Fishes,

DEP Stream Code: 04680

Martins Creek

Migratory Fishes (HQ-CWF, MF) to further enhance the protection of the Class A wild brown trout population present.

3. Send a copy of this report to DEP (through Dave Spotts) requesting consideration of an 25 PA Code, Chapter 93 Water Quality Standards upgrade from Trout Stocking, Migratory Fishes (TSF-MF) to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) based on DEP's aquatic macroinvertebrate metrics for Sections 01, 02 and 03. If appropriate, a 25 PA Code, Chapter 93 Water Quality Standards upgrade would further protect the water quality flowing into Section 04 in support of the established Class A wild brown trout population residing therein.
4. Continue management under statewide Commonwealth Inland Waters angling regulations.

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

Martins Creek (501F)
Section 04
Fisheries Management Report

Prepared by
David A. Arnold

Fisheries Management Database Name: Martins Creek
Lat/Lon: 40°46'31"/75°10'30"

Date Sampled: August 09, 2010 Date Prepared: October 26, 2010

Introduction

Martins Creek is located in Northampton County and is a 19 km (11.81 mi) long tributary flowing southeast to its confluence with the Delaware River at River Mile (RM) 190.6, 40°46'31" latitude and 75°10'30" longitude. This stream has a drainage area of 115 km² (44.4 mi²). The current water quality designation as per Chapter 93 applied to the mainstem of Martins Creek is Trout Stocking, Migratory Fishes (TSF, MF). This stream is already included in the PFBC's listing of Stream Sections that Support Natural Reproduction of Trout. Martins Creek can be found on the Bangor PA-NJ United States Geological Survey 7.5 minute quadrangle.

Section 04 of Martins Creek begins at the dam located 0.6 km upstream of the intersection of Main Street (SR 1015) and Franklin Hill Road (T-651) and continues downstream 3.06 km (1.90 mi) to its confluence with the Delaware River. Previous surveys in 2001 and 2000 at site River Mile (RM) 1.70 and 0.60 documented the presence of a Class A wild brown trout population with an average estimate of 124.80 and 67.22 kg/ha. The high density of wild brown trout was primarily attributed the influence of the habitat at RM 1.70 (dam plunge pool and undercut banks and deep pools at the upper half of the site), whereas RM 0.60 was more representative of the stream section habitat and was slightly wider, shallower, with a reduced frequency of large deep pools and undercut banks. Thus, this area was removed from the catchable trout program in 2002 via resectioning of the creek due to the presence of a high density wild brown trout population.

The Division of Habitat Management has installed the following within Section 04:

RM 1.72 - Completed June 2010 - four multi-vane log deflectors, seven root wad deflectors, one stone deflector, and five boulder placements.

RM 0.63 - Completed September 2009 - four multi-vane log deflectors, three root wad deflectors and 1 stone deflector.

RM 1.16 - Completed October 2008 - 16 root wade deflectors.

This section was surveyed to document the continued presence of a wild brown trout population.

Methods

The examination of Martins Creek was conducted on August 09-10, 2010. All procedures were carried out according to those outlined by Marcinko et al. (1986). Two representative sampling stations totaling 21 percent of the section length was sampled in Section 04.

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). Wild trout were measured and recorded in 25 mm (1.0 in) length groups (LGs). 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: 1.70

Sample site RM 1.70 was located 316 m downstream from the dam just upstream of the intersection of Main Street (SR 1015) and Franklin Hill Road (T-651), 40°47'27" latitude and 75°11'22" longitude. The 315 m long station averaged 9.9 m in width and comprised 10 percent of the total section length (Table 1). This portion of the stream primarily flowed through an open setting, with the right stream bank following along SR 1015 and the left stream bank in a more forested reach, however the tree canopy over the stream was open and provided little cover. Bank erosion was moderate and the stream substrate consisted primarily of boulder, rubble and gravel. Stream flow was low due to the drought conditions experienced in the late summer. Large fish habitat is located in the upper third of the site and consisted of pool and runs, undercut banks and one large plunge pool at the base of the dam. Favorable habitat for legal

size trout (≥ 175 mm or 7 inches) in the lower two thirds of the site was confined to a few areas that were separated by long reaches of shallow riffles and runs. The RBP analysis yielded a final score of 130 (Table 2).

Physical-chemical parameters and their associated values measured under low flow conditions were as follows: air temperature 29.6°C, water temperature 21.0°C, specific conductance 384 umhos, pH 7.5 standard units, and total alkalinity 72 mg/l (Table 3).

Eleven fish species were captured at the site, including wild brown trout *Salmo trutta*. Also present were brook trout *Salvelinus fontinalis*, brown trout, and rainbow trout *Oncorhynchus mykiss* determined to be of hatchery origin. Species composition included fish common to cold, cool and warmwater environment. Fish ordinarily associated with a cold to coolwater environment were most common (Table 4).

Brown Trout

Three hundred twenty-seven wild brown trout ranging from 75 mm to 599 mm total length (TL) were captured during the survey. Two hundred eighty-eight (88 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 288.94 kg/ha. Brown trout abundance was estimated at 1,592 trout/km (2,563 trout/mi) with 1,456 trout/km (2,344 trout/mi) being of legal length or longer (Table 5).

Smallmouth Bass

Seventeen smallmouth bass were caught during this survey. The catch distribution based on 25 mm length groups is as follows: one each in the 75, 150, and 400 mm length groups; two each in the 225 and 300 mm length groups; three each in the 200 and 250 mm length groups; and four in the 175 mm length group.

Site River Mile: 0.6

Sample site RM 0.6 was 408 m downstream of the South Delaware Drive (SR 0611) Bridge, 40°46'54" latitude and 75°10'56" longitude. The 316 m long station averaged 11.2 m in width and comprised 10 percent of the total section length (Table 1). This portion of the stream primarily flowed through an open forested reach, with a small community along the left stream bank. Bank erosion was light and the stream substrate consisted primarily of rubble, gravel and silt. Stream flow was low due to dry summer conditions. The RBP analysis yielded a final score of 118 (Table 2).

Physical-chemical parameters and their associated values measured under low flow conditions were as follows: air temperature 25.7°C, water temperature 19.5°C, specific conductance 384 umhos, pH 7.5 standard units, and total alkalinity 68 mg/l (Table 3).

Nine fish species were captured at the site, including wild brown trout. Hatchery brook trout and rainbow trout were also present. Fish ordinarily associated with a cold to coolwater environment were most common (Table 4).

Brown Trout

One hundred forty-four wild brown trout ranging from 75 mm to 449 mm total length (TL) were captured during the survey. One hundred four (72 percent) were greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 59.44 kg/ha. Brown trout abundance was estimated at 529 trout/km (852 trout/mi) with 403 trout/km (649 trout/mi) being of legal length or longer (Table 5).

Smallmouth Bass

Three smallmouth bass were caught during this survey, one each in the 200, 225 and 350 mm length groups.

Discussion

Section 04 of Martins Creek supported natural reproduction of brown trout. The average brown trout density in 2010 in Section 04 was 174.19 kg/ha. The density of brown trout at each site (RM 1.70 - 288.94 kg/ha; RM 0.60 - 59.44 kg/ha) met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (\geq 40.00 kg/ha) for a Class A wild brown trout population (Anonymous 2009).

As noted above, the very high density of wild brown trout is attributable to the habitat present at RM 1.70, which is atypical for this reach of stream. The habitat present at RM 0.60 without the influence of the dam and its impacted area downstream is more representative of the stream habitat and carrying capacity. However, what site RM 1.70 does show is the potential of this stream with the proper habitat in place. Therefore, this section should be assessed by the Division of Habitat Management for potential work as long as it remains open to the public.

Section 03 of Martins Creek is stocked with rainbow trout fingerlings in addition to adult trout (rainbow trout only since 2008). All of the rainbow trout caught in Section 04 (RM 1.70, N=3; RM 0.60, N=6) were of adult hatchery origin based on the presence of fin deformities typically present in adult stocked trout but not in fingerling trout.

The current 25 PA Code Chapter 93 Water Quality Standards listing of Trout Stocking, Migratory Fishes (TSF, MF) for this section of Martins Creek, and perhaps upstream in the Martins Creek basin does not adequately protect the existing flora and fauna present within the basin. Based on the presence of a Class A wild brown trout population, it is recommend that the water quality designation of Section 04, and perhaps the upstream drainage as well (to ensure

that Section 04 is protected from upstream influences), be upgraded to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF).

Management Recommendations

1. Submit Section 04 of Martins Creek to the Board of Commissioners for consideration as a Class A wild brown trout water.
2. Upgrade the Chapter 93 water quality designation from Trout Stocking, Migratory Fishes (TSF, MF) to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) to further enhance the protection of the Class A wild brown trout population present.
3. Send a copy of this report to DEP (through Dave Spotts) requesting consideration of an 25 PA Code, Chapter 93 Water Quality Standards upgrade from Trout Stocking, Migratory Fishes (TSF-MF) to High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) based on DEP's aquatic macroinvertebrate metrics for Sections 01, 02 and 03. If appropriate, a 25 PA Code, Chapter 93 Water Quality Standards upgrade would further protect the water quality flowing into Section 04 in support of the established Class A wild brown trout population residing therein.
4. Continue management under statewide Commonwealth Inland Waters angling regulations.

Anonymous, 2009. Strategic Plan for Management of Trout Fisheries in Pennsylvania 2010 - 2014, PFBC Files, 450 Robinson Lane, Bellefonte, PA.

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.

Marcinko, M., R. Lorson, and R. Hoopes, 1986. Procedures for stream and river inventory information input. PFBC Files, 450 Robinson Lane, Bellefonte, PA.

DEP Stream Code: 04680 (501F), Section 04, Northampton County. Martins Creek location, length surveyed, average site width and site area.

Site Date	Rivermile	Downstream limit description	Length (m)	Ave. Width (m)	Site Area (ha)
8/9/2010	1.70	316m downstream from dam located upstream from intersection of SR 1015 and Franklin Hill Road (T-651).	316	9.9	0.31
8/9/2010	0.60	408 m downstream SR 0611 bridge.	316	11.2	0.35

Table 2. High Gradient Rapid Bioassessment Protocol ratings Martins Creek (501F), Section 04, Northampton County conducted at RM 1.70 (404727/751122) and 0.60 (404654/751056) on August 09, 2010.

RM 1.70			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	16	Left Bank Stability	6
Embeddedness	15	Right Bank Stability	6
Velocity / Depth Regime	19	Left Bank Vegetative Protection	6
Sediment Deposition	12	Right Bank Vegetative Protection	6
Channel Flow Status	9	Left Bank Riparian Vegetative Width	6
Channel Alteration	9	Right Bank Riparian Vegetative Width	3
Frequency of Riffles or bends	17	Total Score	130

RM 0.60			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	13	Left Bank Stability	6
Embeddedness	13	Right Bank Stability	6
Velocity / Depth Regime	19	Left Bank Vegetative Protection	6
Sediment Deposition	10	Right Bank Vegetative Protection	3
Channel Flow Status	9	Left Bank Riparian Vegetative Width	4
Channel Alteration	11	Right Bank Riparian Vegetative Width	2
Frequency of Riffles or bends	16	Total Score	1118

Table 3. Time series site chemistries from Martins Creek at site river-mile 1.70 (404727/751122) and 0.60 (404654/751056). These sites are currently located within Section 04 within sub-basin 01F.

Chemical Tests	RM 1.70			RM 0.60		
	8/9/2010	8/15/2001	8/14/2000	8/9/2010	8/15/2001	8/14/2000
Air Temperature ©	29.6	28.0	19.0	25.7	22.0	19.0
pH Field Colorimetric (SU)	7.5	7.6	7.5		7.5	7.3
pH Field Electrometric (SU)				7.5		
Specific Conductance (UMHOS)	384	395	425	384	345	280
Total Alkalinity Field Mixed Indicator (MG/L)	72		54	68	64	50
Total Hardness Field EDTA (MG/L)			116			116
Water Temperature ©	21.0	23.0	17.5	19.5	19.0	12.0

DEP Stream Code: 04680

Martins Creek

Table 4. Fish species occurrence in Section 04, Martins Creek (501F), Northampton County at sample sites RM 1.70 (404727/751122) and 0.60 (404654/751056) in August 2010, 2001 and 2000.

RM 1.70					
Common Name	Scientific Name	8/9/2010	8/15/2001	8/14/2000	
American Eel	<i>Anguilla rostrata</i>	X	X		
Blacknose Dace	<i>Rhinichthys atratulus</i>	X	X		
Bluegill	<i>Lepomis macrochirus</i>	-	X		
Brook Trout	<i>Salvelinus fontinalis</i>	-	-	X	
Brook Trout - Hatchery	<i>Salvelinus fontinalis</i>	X	X		
Brown Trout	<i>Salmo trutta</i>	X	X	X	
Brown Trout - Hatchery	<i>Salmo trutta</i>	X	X	X	
Common Shiner	<i>Luxilus cornutus</i>	-	X		
Fallfish	<i>Semotilus corporalis</i>	X	-		
Longnose Dace	<i>Rhinichthys cataractae</i>	X	X		
Pumpkinseed	<i>Lepomis gibbosus</i>	X	-		
Rainbow Trout - Hatchery	<i>Oncorhynchus mykiss</i>	X	X	X	
Smallmouth Bass	<i>Micropterus dolomieu</i>	X	-		
Tessellated Darter	<i>Etheostoma olmstedii</i>	X	X		
White Sucker	<i>Catostomus commersonii</i>	X	X		

RM 0.60					
Common Name	Scientific Name	8/9/2010	8/15/2001	8/14/2000	
American Eel	<i>Anguilla rostrata</i>	X	X	X	
Black Crappie	<i>Pomoxis nigromaculatus</i>	-	X	-	
Blacknose Dace	<i>Rhinichthys atratulus</i>	X	X	-	
Brook Trout - Hatchery	<i>Salvelinus fontinalis</i>	X	-	-	
Brown Trout	<i>Salmo trutta</i>	X	X	X	
Brown Trout - Hatchery	<i>Salmo trutta</i>	-	X	X	
Fallfish	<i>Semotilus corporalis</i>	-	-	-	
Longnose Dace	<i>Rhinichthys cataractae</i>	X	X	X	
Pumpkinseed	<i>Lepomis gibbosus</i>	X	-	-	
Rainbow Trout - Hatchery	<i>Oncorhynchus mykiss</i>	X	-	X	
Smallmouth Bass	<i>Micropterus dolomieu</i>	X	-	X	
Tessellated Darter	<i>Etheostoma olmstedii</i>	-	X	-	
White Sucker	<i>Catostomus commersonii</i>	X	X	X	

DEP Stream Code: 04680 wild brown trout Petersen abundance estimates collected at sample sites RM 1.70 (404727/751122) and 0.60 (404654/751056) in Section 04 of Martins Creek (501F), Northampton County collected in August 2010, 2001, and 2000.

25mm Length Group	River Mile											
	1.70						0.60					
	8/9/2010		8/15/2001		8/14/2000		8/9/2010		8/15/2001		8/14/2000	
	Kg/ha	#/km	Kg/ha	#/km	Kg/ha	#/km	Kg/ha	#/km	Kg/ha	#/km	Kg/ha	#/km
50									0.01	3	0.01	3
75	0.40	54	0.45	54	0.09	13	0.39	60	0.29	47	0.05	6
100	0.36	25	0.79	67	0.61	57	0.63	51	0.86	57	0.55	44
125					0.10	6	0.25	9	0.14	6	0.34	16
150	2.90	57	0.19	3			0.28	6	0.16	3	0.51	3
175	29.99	441	15.61	187	1.59	29	4.56	76				
200	42.7	425	40.86	337	10.15	133	12.64	142	4.70	44	1.41	16
225	18.97	146	23.64	146	17.35	156	9.45	82	3.81	25	9.49	76
250	20.27	114	11.82	54	7.50	48	6.45	41	5.70	28	3.92	28
275	26.82	114	15.36	54	16.72	76	1.31	6	3.39	13	2.20	9
300	14.86	51	7.98	25	14.73	60	5.73	22	10.2	32	2.63	9
325	16.78	44	19.95	44	7.87	25	2.11	6	1.22	3	3.05	9
350	8.00	16	12.12	22	8.65	22	8.73	19	3.01	6	2.49	6
375	12.29	22	2.19	3	4.88	10			1.85	3		
400	11.35	16	4.42	6	5.90	10	2.00	3	2.59	3		
425	13.86	16	21.3	22	2.43	3	4.91	6				
450	17.59	16	9.07	6	2.53	3						
475	15.39	13	11.34	10								
500	8.52	6	10.42	6	6.65	6			4.16	3		
525	19.97	13										
550												
575	7.92	3										
Totals	288.94	1592	207.51	1046	107.75	657	59.44	529	42.09	276	26.65	225
Estimated Section Average Biomass Kg/ha	2010 174.19		2001 124.80		2000 67.22							

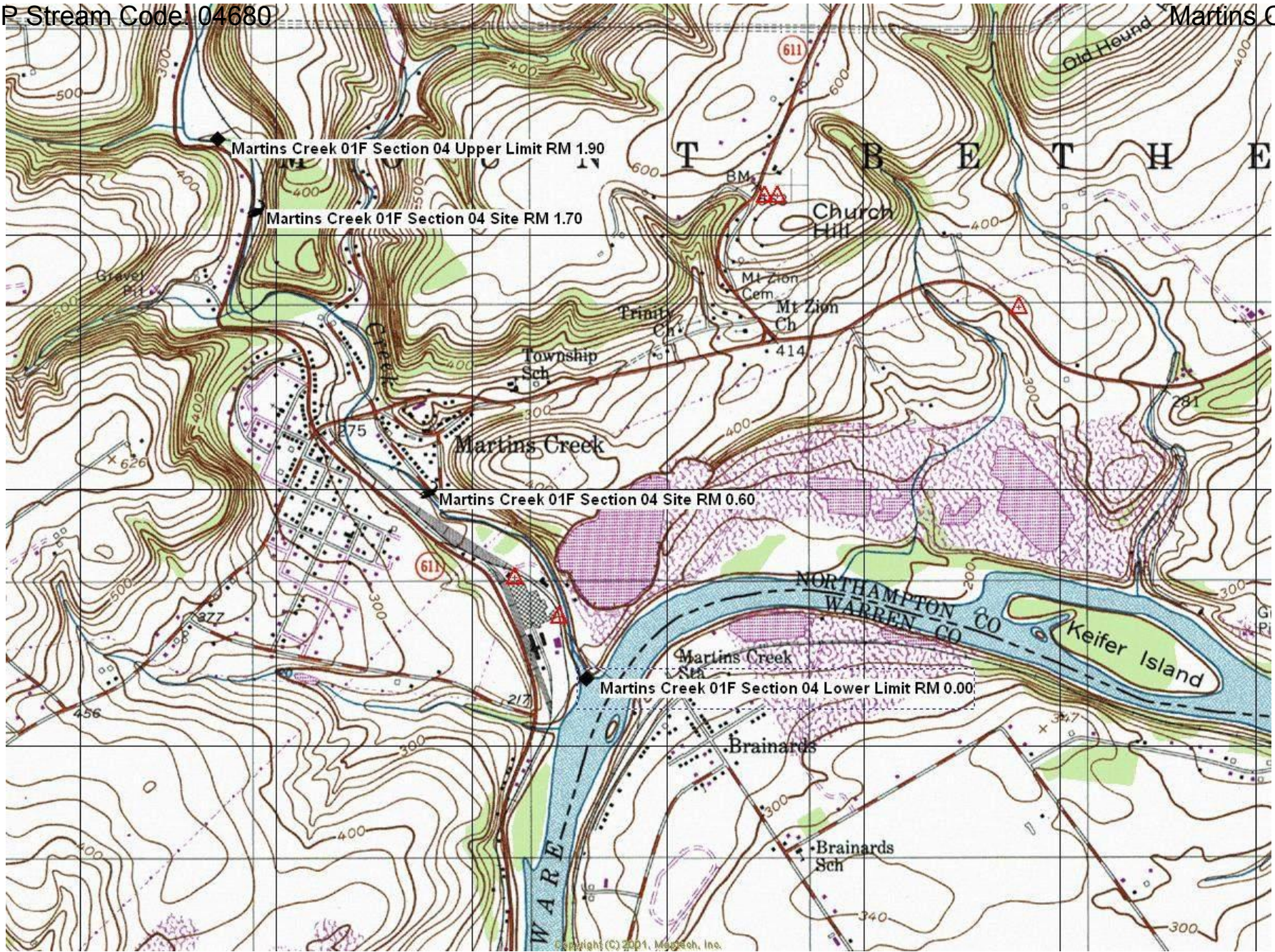


Figure 1. Location map for sample sites river mile 1.70 and 0.60 on Martins Creek (501F), Section 04, Northampton County, USGS Topographic 7.5 Minute Quadrangle Bangor, PA.