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PA FISH AND BOAT COMMISSION
COMMENTS AND RECOMMENDATIONS

February 22, 2018

WATER: Beaver Run (502B) Carbon County

EXAMINED: July 03 and July 06, 2012

BY: Fisheries Management Area 5 - Arnold, Chikotas, and Vernoski

Bureau Director Action: _____ Date: _____

Division Chief Action: _____ Date: _____

CW Unit Leader Action: _____ Date: _____

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AREA COMMENTS:

Section 01 of Beaver Run has been resectioned into two sections based on the findings of this survey. Section 01 extends from the headwaters (RM 3.43) downstream 3.30 km (2.05 mi) to the remnant dam located 0.22 km downstream from the Packerton Drive (SR 3006) Bridge (RM 1.38). Section 02 extends from the remnant dam outlet located 0.22 km downstream from the Packerton Drive (SR 3006) Bridge 2.22 km (1.38 mi) to the mouth. The resectioning of Beaver Run was based upon the presence of a Class A wild brook trout population upstream of RM 1.38, and a Class A wild brown trout population downstream of RM 1.38. Although wild brook trout and brown trout were present at all sampling sites, wild brook trout accounted for 78 percent of the total trout biomass at RM 1.40, whereas wild brown trout accounted for 92 and 96 percent of the total trout biomass at sampling sites RM 0.34 and 0.17, respectively.

Section 01

Section 01 supported natural reproduction of wild brook trout and brown trout, with brook trout being the dominant species. The combined trout biomass estimate was 66.74 kg/ha and brook trout comprised 78 percent (51.90 kg/ha) of the total trout biomass. The sample site at RM 1.40 covered 10 percent of the total section length. The estimated brook trout biomass met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (>30.00 kg/ha) for a Class A wild brook trout water, as outlined in 58 PA Code §57.8a., Class A Wild Trout Streams.

Section 02

Section 02 supported natural reproduction of wild brook trout and brown trout, with brown trout being the dominant species. The combined trout biomass estimate was 127.65 kg/ha at RM 0.34 and brown trout comprised 92 percent (117.95 kg/ha) of the total trout biomass. The combined trout biomass estimate was 176.38 kg/ha at RM 0.17 and brown trout comprised 96 percent (169.99 kg/ha) of the total trout biomass. The two sampling sites covered 26 percent (RM 0.34, 15 percent; RM 0.17, 11 percent) of the total section length. The two site mean estimated brown trout biomass of 143.96 kg/ha met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (>40.00 kg/ha) for a Class A wild brown trout water, as outlined in 58 PA Code §57.8a., Class A Wild Trout Streams.

Sample site RM 0.17 was added to the stream survey after staff learned, while on site, that a mall/shopping complex might be developed in the old Packerton Railroad Yard. Furthermore, in 2011 Fisheries Biologist Aid Robert Zellers noted that there were trout present downstream of the SR 0209/0093 bridge. As the stream flows through the Packerton Railroad Yard it is tunneled in many areas under the tracks. However, the reach of stream immediately downstream of the SR 0209/0093 Bridge to the first railroad bed tunnel, a distance of 255 m, was determined to be accessible from an electrofishing standpoint.

The degraded stream condition noted for RM 0.17 is reflected in the change of RBP values from 128 at site RM 0.34 (reported in 2011) to 88 at site RM 0.17 in 2012. The RBP values indicate that the stream has declined from suboptimal to marginal. The main reason this area supports wild trout is the dense shading provided by bank vegetation (Japanese Knotweed) and the tunnel reaches. Staff wanted to document the presence of wild trout within this area before any restructuring of the property began, and has notified Tom Shervinskis, Chief of Watershed Analysis in the PFBC's Division of Environmental Services, of our survey findings and the proposed development action for the old Packerton Railroad Yard.

Not covered in this report are the findings from a survey conducted as part of the Lehigh River hatchery fingerling stocking evaluation. For this evaluation all hatchery fingerling brown trout and rainbow trout stocked in Lehigh River, Section 07, during the spring of 2011 were fin marked (adipose clip) prior to stocking. As part of the evaluation the Delaware River Biologist requested that the lower reaches of tributaries be surveyed to determine if any of the fin marked fingerlings were present in tributary streams. On July 13, 2011, the lower reach of Beaver Run was surveyed. The site at RM 0.00 was 27 m in length and extended from the mouth upstream to the downstream tunnel in the old Packerton Railroad Yard. The total number of trout caught by species included, five wild brown trout (125-224 mm TL), two hatchery brown trout fingerlings with adipose clips (75-99 mm TL), and one hatchery brook trout (300-324 mm TL). The upstream movement of trout from this lower reach of stream is primarily restricted to high water events in the river. The movement of fish under normal and low flows farther upstream into Beaver Run is severely hindered by vertical separation of flow at the railroad tunnel culvert.

Water Quality

The current 25 PA Code Chapter 93 Water Quality Standards listing of Trout Stocking, Migratory Fishes (TSF, MF) for the Beaver Run basin does not adequately protect the existing flora and fauna present within the basin. Based on the Class A wild brook trout population in Section 01 and the Class A wild brown trout population in Section 02, the water quality designation that affords adequate protection to both sections is High Quality-Cold Water Fishes, Migratory Fishes (HQ-CWF, MF). Based on the findings of the 2011 survey, this stream has already been appended to the list of stream sections that support natural reproduction of trout as outlined in 58 PA Code §57.11., Listing of Wild Trout Streams.

AREA RECOMMENDATIONS:

1. Submit Beaver Run (502B), Section 01, to be officially designated as a Class A wild brook trout water from the headwaters (RM 3.43) downstream to the remnant dam located 0.22 km downstream from the Packerton Drive Bridge (RM 1.38).
2. Submit Beaver Run (502B), Section 02, to be officially designated as a Class A wild brown trout water from the remnant dam located 0.22 km downstream from the Packerton Drive Bridge (RM 1.38) downstream to the mouth.
3. Provide a copy of this report to DEP for their consideration of a Chapter 93 Water Quality Standards designation upgrade of the Beaver Run (502B) basin from Trout Stocking, Migratory Fishes (TSF, MF) to High Quality-Cold Water Fishes, Migratory Fishes (HQ-CWF, MF).
4. Retain Beaver Run (502B), Sections 01 and 02, on the list of stream sections that support natural reproduction of trout from the headwaters downstream to the mouth.
5. Continue management of Beaver Run (502B), Sections 01 and 02, under Commonwealth Inland Waters angling regulations with no stocking.
6. Forward copies of this report to the Divisions of Habitat Management and Environmental Services to inform them of the storm water drainage effects, immigration barrier near the confluence with the Lehigh River caused by elevated tunnel culverts, and to ensure protection of the wild brown trout population during the possible development of the old Packerton Railroad Yards, between RM 0.34 and the mouth.

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

Beaver Run (502B)
Sections 01-02
Fisheries Management Report

Prepared by
David A. Arnold and Bryan A. Chikotas

Fisheries Management Database Name: Beaver Run
Lat/Lon: 40°50'59"/75°42'33"

Sampled: July 03 and July 06, 2012 Prepared: November 20, 2012

Introduction

Beaver Run is located in Carbon County and is a 5.52 km (3.43 mi) long tributary to the Lehigh River at River Mile (RM) 44.69, 40°50'59" latitude and 75°42'33" longitude. This stream has a drainage area of 6.53 km² (2.52 mi²) and flows northeast to its confluence with the Lehigh River. The current water quality designation of Beaver Run is Trout Stocking, Migratory Fishes (TSF, MF). Beaver Run has been officially appended to the list of stream sections that support natural reproduction of trout based on the 2011 survey. Thus, all wetlands within its basin are classified as Exceptional Value and protected as outlined in 58 PA Code §57.11., Listing of Wild Trout Streams. Beaver Run can be found on the Lehigh and Nesquehoning PA United States Geological Survey 7.5 minute quadrangles (Figure 1).

Section 01 was surveyed in July 2011 as part of the PFBC's unassessed waters initiative (Arnold and Chikotas, 2011). One sample site at RM 0.34 located on upstream side of the SR 0209/0093 bridge was surveyed. The 305 m long station averaged 3.1 m in width and covered six percent of the total section length. This portion of the stream flowed primarily through a rural residential setting bordered by forested hillsides. Japanese knotweed (*Polygonum cuspidatum*) was the dominant vegetation on both stream banks, especially at the lower end of site.

The survey of site RM 0.34 found wild brown trout *Salmo trutta* and brook trout *Salvelinus fontinalis*. Brown trout were the dominant salmonid species, with an estimated biomass of 100.76 kg/ha, which met the Pennsylvania Fish and Boat Commission's minimum biomass criteria for a Class A wild brown trout population (\geq 40.00 kg/ha). Brook trout were present in low density having an estimated biomass of 4.97 kg/ha. However, since the sample site covered only six

percent of the section length, it did not meet the recommended minimum criteria of 10 percent. Thus, it was recommended that the stream be revisited in 2012 to determine if it met Class A criteria.

Beaver Run was resurveyed in July 2012 to provide sufficient information for possible listing of this stream as a Class A wild trout water.

Methods

The examination of Beaver Run was conducted on July 03 and July 06, 2012. All procedures were carried out according to those outlined by Detar et al. (2011). Three representative sampling stations totaling 16 percent of the stream length were sampled in 2012.

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 200 volts AC-Alternating Current (Battery Backpack). 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 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 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: 1.40

Sample site RM 1.40 was located 38 meters downstream from the Packerton Drive (SR 3006) Bridge, 40°50'38" latitude and 75°43'50" longitude. The 330 m long station averaged 3.2 m in width (Table 1). It was a shallow clear stream with a relatively wide channel for the amount of flow. The stream channel eroded more laterally, thereby widening, than it did vertically to deepen. Shading was provided by a mix of partial and dense canopy as the stream flowed through a mature forest. The stream substrate was composed mostly of rubble and gravel, with some sand, and occasional boulder and bedrock areas. Habitat for fish included water depths (up to 0.5 meters) in short poorly defined pools and extensive runs and riffles that made up most of the habitat. Some pocket water around larger rocks also provided cover for fish. The RBP analysis yielded a final score of 165, which rated this area of stream in the optimal range (Table 2).

Physical-chemical parameters and their associated values measured under normal flow conditions were as follows: air temperature 27.4°C, water temperature 15.3°C, specific conductance 50 umhos, pH 6.7 standard units, and total alkalinity 16 mg/l (Table 3).

Five fish species were captured at site RM 1.40 including, wild brown trout and brook trout, and hatchery brown trout. Community composition included fish common to coldwater and cool water environments. Fish common to a coldwater stream were the most prevalent species present (Table 4).

Brown Trout

Fifty-two wild brown trout ranging from 50 mm to 274 mm in total length (TL) were captured during the survey with fourteen (27 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 14.84 kg/ha. Brown trout abundance was estimated at 163 trout/km (262 trout/mi) with 48 trout/km (77 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Two hundred and sixty-seven wild brook trout ranging from 25 mm to 224 mm in total length (TL) were captured during the survey with thirteen (five percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brook trout biomass was estimated to be 51.90 kg/ha. Brook trout abundance was estimated at 2030 trout/km (3268 trout/mi) with 45 trout/km (72 trout/mi) being of legal length or longer (Table 6).

Brown Trout - Hatchery

One brown trout determined to be of hatchery origin was captured in the 250 size group during this survey.

Site River Mile: 0.34

Sample site RM 0.34 was located at the upstream side of SR0209/0093 Bridge, 40°51'05" latitude and 75°42'46" longitude, and is a repeat of 2011 station to obtain additional information with regard to wild trout abundance for possible Class A listing. The 305 m long station averaged 3.6 m in width (Table 1). This portion of the stream flowed primarily through a rural residential setting bordered by forested hillsides. Japanese knotweed (*Polygonum cuspidatum*) was the dominant vegetation on both stream banks, especially at the lower end of the site. Bank erosion was light to moderate and the substrate consisted primarily of rubble, gravel and silt. The site was very similar in appearance to that evaluated in 2011.

Physical-chemical parameters and their associated values were not collected at this site.

Five fish species were captured at site RM 0.34 including, wild brown trout and brook trout. Community composition included fish common to coldwater and cool water environments. Fish common to a coldwater stream were the most prevalent species present (Table 4).

Brown Trout

Two hundred and thirty-two wild brown trout ranging from 25 mm to 374 mm in total length (TL) were captured during the survey with eighty-five (37 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 117.95 kg/ha. Brown trout abundance was estimated at 1754 trout/km (2824 trout/mi) with 328 trout/km (528 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Twenty wild brook trout ranging from 50 mm to 299 mm in total length (TL) were captured during the survey with six (30 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brook trout biomass was estimated to be 9.70 kg/ha. Brook trout abundance was estimated at 74 trout/km (119 trout/mi) with 19 trout/km (31 trout/mi) being of legal length or longer (Table 6).

Site River Mile: 0.17

Sample site RM 0.17 was located at the upstream face of the first railroad tunnel downstream from the SR 0209/0093 Bridge in the old Packerton Railroad Yards, 40°50'59" latitude and 75°42'43" longitude. The 255 m long station averaged 3.2 m in width (Table 1). The stream was mostly shaded during summer, especially along the margins by dense growth of Japanese knotweed. The stream substrate was comprised of unconsolidated gravel, sand, and silt with rocks of rubble size scattered within the site. Habitat for fish consisted of undercut banks, water depths in pools, and dense overhanging vegetation. The stream channel was most likely straightened during the construction of the railroad yard. The stream in this area received excessive storm water runoff from mountainous terrain delivered via SR0209/0093 and Packerton Drive (SR 3006). The RBP analysis yielded a final score of 88 (Table 2), which categorized this reach of stream as marginal.

Physical-chemical parameters and their associated values were not collected at this site.

Six fish species were captured at site RM 0.17 including, wild brown trout and brook trout. Community composition included fish

common to coldwater and cool water environments. Fish common to a coldwater stream were the most prevalent species present (Table 4).

Brown Trout

One hundred and seventy-one wild brown trout ranging from 50 mm to 324 mm in total length (TL) were captured during the survey with seventy-nine (46 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brown trout biomass was estimated to be 169.99 kg/ha. Brown trout abundance was estimated at 1361 trout/km (2191 trout/mi) with 511 trout/km (823 trout/mi) being of legal length or longer (Table 5).

Brook Trout

Eight wild brook trout ranging from 125 mm to 249 mm in total length (TL) were captured during the survey with five (63 percent) being greater than or equal to the legal harvestable length (175 mm: 7 in). Total brook trout biomass was estimated to be 6.39 kg/ha. Brook trout abundance was estimated at 32 trout/km (52 trout/mi) with 20 trout/km (32 trout/mi) being of legal length or longer (Table 6).

Discussion

Based on the results from this examination Beaver Run has been resectioned into two management sections. Section 01 extends from the headwaters (RM 3.43) downstream 3.30 km (2.05 mi) to the remnant dam located 0.22 km downstream from the Packerton Drive (SR 3006) Bridge (RM 1.38). Section 02 extends from the remnant dam located 0.22 km downstream from the Packerton Drive (SR 3006) Bridge downstream 2.22 km (1.38 mi) to the mouth. The resectioning of Beaver Run was based upon the presence of a Class A wild brook trout population upstream of RM 1.38, and a Class A wild brown trout population downstream of RM 1.38. Although wild brook trout and brown trout were present at all sample sites, wild brook trout accounted for 78 percent of the total trout biomass at RM 1.40. Whereas, wild brown trout accounted for 92 and 96 percent of the total trout biomass at sampling sites RM 0.34 and 0.17, respectively.

Section 01

Section 01 supported natural reproduction of wild brook trout and brown trout, with brook trout being the dominant species. The combined trout biomass estimate was 66.74 kg/ha and brook trout comprised 78 percent (51.90 kg/ha) of the total trout biomass. The sample site at RM 1.40 covered 10 percent of the total section length and based on the results from this survey, Section 01 qualified to be managed as a Class A wild brook trout water (PFBC 2011). The estimated brook trout biomass met the Pennsylvania Fish and Boat Commission's minimum biomass criteria (≥ 30.00 kg/ha) for a

Class A wild brook trout population, as outlined in 58 PA Code §57.8a., Class A Wild Trout Streams.

Section 02

Section 02 supported natural reproduction of wild brook trout and brown trout, with brown trout being the dominant species. The combined trout biomass estimate was 127.65 kg/ha at RM 0.34 and brown trout comprised 92 percent (117.95 kg/ha) of the total trout biomass. The combined trout biomass estimate was 176.38 kg/ha at RM 0.17 and brown trout comprised 96 percent (169.99 kg/ha) of the total trout biomass. The two sampling sites covered 26 percent (RM 0.34, 15 percent; RM 0.17, 11 percent) of the total section length. The two site mean estimated brown trout biomass of 143.96 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 outlined in 58 PA Code §57.8a., Class A Wild Trout Streams.

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The degraded stream condition noted for RM 0.17 is reflected in the change of RBP values from 128 at site RM 0.34 (reported in 2011) to 88 at site 0.17 in 2012. , The RBP values indicate that the stream habitat has declined from suboptimal to marginal. The main reason this area supports wild trout is the dense shading provided by bank vegetation (Japanese Knotweed) and the tunnel reaches. Staff wanted to document the presence of wild trout within this area before any restructuring of the property began, and has notified Tom Shervinskie, Chief of Watershed Analysis in the PFBC's Division of Environmental Services, of our survey findings and the proposed development action for the old Packerton Railroad Yard.

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Water Quality

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Management Recommendations

1. Submit Beaver Run (502B), Section 01, to be officially designated as a Class A wild brook trout water from the headwaters (RM 3.43) downstream to the remnant dam located 0.22 km downstream from the Packerton Drive Bridge (RM 1.38).
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3. Provide a copy of this report to DEP for their consideration of a Chapter 93 Water Quality Standards desination upgrade of the Beaver Run (502B) basin from Trout Stocking, Migratory Fishes (TSF, MF) to High Quality-Cold Water Fishes, Migratory Fishes (HQ-CWF, MF).
4. Retain Beaver Run (502B), Sections 01 and 02, on the list of stream sections that support natural reproduction of trout from the headwaters to the mouth.
5. Continue management of Beaver Run (502B), Sections 01 and 02, under Commonwealth Inland Waters angling regulations with no stocking.
6. Forward copies of this report to the Divisions of Habitat Management and Environmental Services to inform them of the

storm water drainage effects, immigration barrier near the confluence with the Lehigh River caused by elevated tunnel culverts, and to ensure protection of the wild brown trout population during the possible development of the old Packerton Railroad Yards, between RM 0.34 and the mouth.

Literature Cited

- Arnold, D.A., and B.A. Chikotas. 2011. Beaver Run (502B), Section 01 Fisheries Management Report. PFBC Files, 450 Robinson Lane, Bellefonte, PA.
- 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.
- Detar, J., R. Wnuk, R.T. Greene, M. Kaufmann. 2011 Standard electrofishing protocols for sampling Pennsylvania wadeable streams. Pages 5-24 in D. Miko, editor. Sampling protocols for Pennsylvania's wadeable streams. Pennsylvania Fish and Boat Commission. Harrisburg, PA.
- Pennsylvania Fish and Boat Commission. 2011. Operational guidelines for the management of trout fisheries in Pennsylvania waters. PFBC Files, 450 Robinson Lane, Bellefonte. PA.

Table 1. Beaver Run (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)
7/3/2012	1.40	38 meters downstream SR 3006 (Packerton Drive) Bridge	330	3.2	0.11
7/3/2012	0.34	Upstream side of SR0209 bridge	305	3.6	0.11
7/6/2012	0.17	Downstream side of SR0209/0093 Bridge, began electrofishing at first downstream railroad bridge culvert/tunnel.	255	3.2	0.08

Table 2. High Gradient Rapid Bioassessment Protocol ratings for Beaver Run (502B), Carbon County, conducted at sites RM 1.40 and 0.17 in July, 2012.

RM 1.40			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	16	Left Bank Stability	8
Embeddedness	17	Right Bank Stability	8
Velocity / Depth Regime	18	Left Bank Vegetative Protection	9
Sediment Deposition	15	Right Bank Vegetative Protection	9
Channel Flow Status	15	Left Bank Riparian Vegetative Width	9
Channel Alteration	14	Right Bank Riparian Vegetative Width	9
Frequency of Riffles or bends	18	Total Score	165
RM 0.17			
Habitat Parameter	Score	Habitat Parameter	Score
Epifaunal Substrate / Available Cover	6	Left Bank Stability	6
Embeddedness	4	Right Bank Stability	6
Velocity / Depth Regime	15	Left Bank Vegetative Protection	4
Sediment Deposition	3	Right Bank Vegetative Protection	4
Channel Flow Status	14	Left Bank Riparian Vegetative Width	3
Channel Alteration	11	Right Bank Riparian Vegetative Width	5
Frequency of Riffles or bends	7	Total Score	88

Table 3. Chemistries collected in Beaver Run (502B), Carbon County, at site RM 1.40 in 2012 sample year.

Parameter	Site 1
Sample Date	07/03/2012
Time (24 hour)	1159
Water Temperature (C)	15.3
pH Field Colorimetric (SU)	6.7
Specific Conductance (UMHOS)	50
Total Alkalinity Field Mixed Indicator (MG/L)	16
Air Temperature (C)	27.4

Table 4. Fish species occurrence Beaver Run (502B), Carbon County, at sample sites RM 1.40, RM 0.34, and RM 0.17 in July, 2012.

Common Name	Scientific Name	RM 1.40	RM 0.34	RM 0.17
American Eel	<i>Anguilla rostrata</i>	X	X	X
Blacknose Dace	<i>Rhinichthys atratulus</i>	X	X	X
Brook Trout	<i>Salvelinus fontinalis</i>	X	X	X
Brown Trout	<i>Salmo trutta</i>	X	X	X
Brown Trout - Hatchery	<i>Salmo trutta</i>	X	-	-
Tessellated Darter	<i>Etheostoma olmstedi</i>	X	X	X
White Sucker	<i>Catostomus commersonii</i>	-	-	X

Table 5. Wild brown trout Petersen abundance and biomass estimates at sample sites RM 1.40, RM 0.34 and RM 0.17 on Beaver Run (502B), Carbon County, in July, 2012.

RM 1.40						
Size Group	Estimate	Low95CI	High95CI	NumHa	KgHa	NumKm
50	12			114	0.29	36
75	23			218	1.39	70
125	3			28	0.75	9
175	11	5	28	104	7.0	33
200	4			38	3.68	12
250	1			9	1.73	3
Totals	54			511	14.84	163
RM 0.34						
25	1			9	0.01	3
50	296	147	647	2696	6.82	970
75	121	57	280	1102	7.04	397
125	7			64	1.68	23
150	10	5	23	91	3.99	33
175	29	17	53	264	17.74	95
200	42	27	69	383	37.14	138
225	18	9	38	164	22.11	59
250	9	4	22	82	14.95	30
275	1			9	2.16	3
350	1			9	4.31	3
Totals	535			4873	117.95	1754
RM 0.17						
50	147	60	368	1801	4.56	576
75	42	17	105	515	3.29	165
125	8	4	20	98	2.58	31
150	20			245	10.75	78
175	57	27	131	699	46.92	224
200	54	27	119	662	64.26	212
225	12	6	25	147	19.83	47
250	5			61	11.18	20
275	1			12	2.9	4
300	1			12	3.72	4
Totals	347			4252	169.99	1361

Table 6. Wild brook trout Petersen abundance and biomass estimates at sample sites RM 1.40, RM 0.34, and RM 0.17 on Beaver Run (502B), Carbon County, in July, 2012.

RM 1.40						
Size Group	Estimate	Low95CI	High95CI	NumHa	KgHa	NumKm
25	3			28	0.03	9
50	517	300	969	4896	11.99	1567
75	35	18	74	331	1.98	106
100	10	4	24	95	1.30	30
125	51	30	96	483	11.79	155
150	39	23	69	369	15.18	118
175	13	6	28	123	7.88	39
200	2			19	1.75	6
Totals	670			6344	51.90	2030
RM 0.34						
50	1			9	0.02	3
75	1			9	0.05	3
125	12	5	31	109	2.67	39
150	3			27	1.12	10
175	3			27	1.75	10
200	1			9	0.84	3
225	1			9	1.19	3
275	1			9	2.06	3
Totals	23			208	9.70	74
RM 0.17						
125	1			12	0.30	4
150	2			25	1.01	8
175	3			37	2.35	12
200	1			12	1.13	4
225	1			12	1.60	4
Totals	8			98	6.39	32

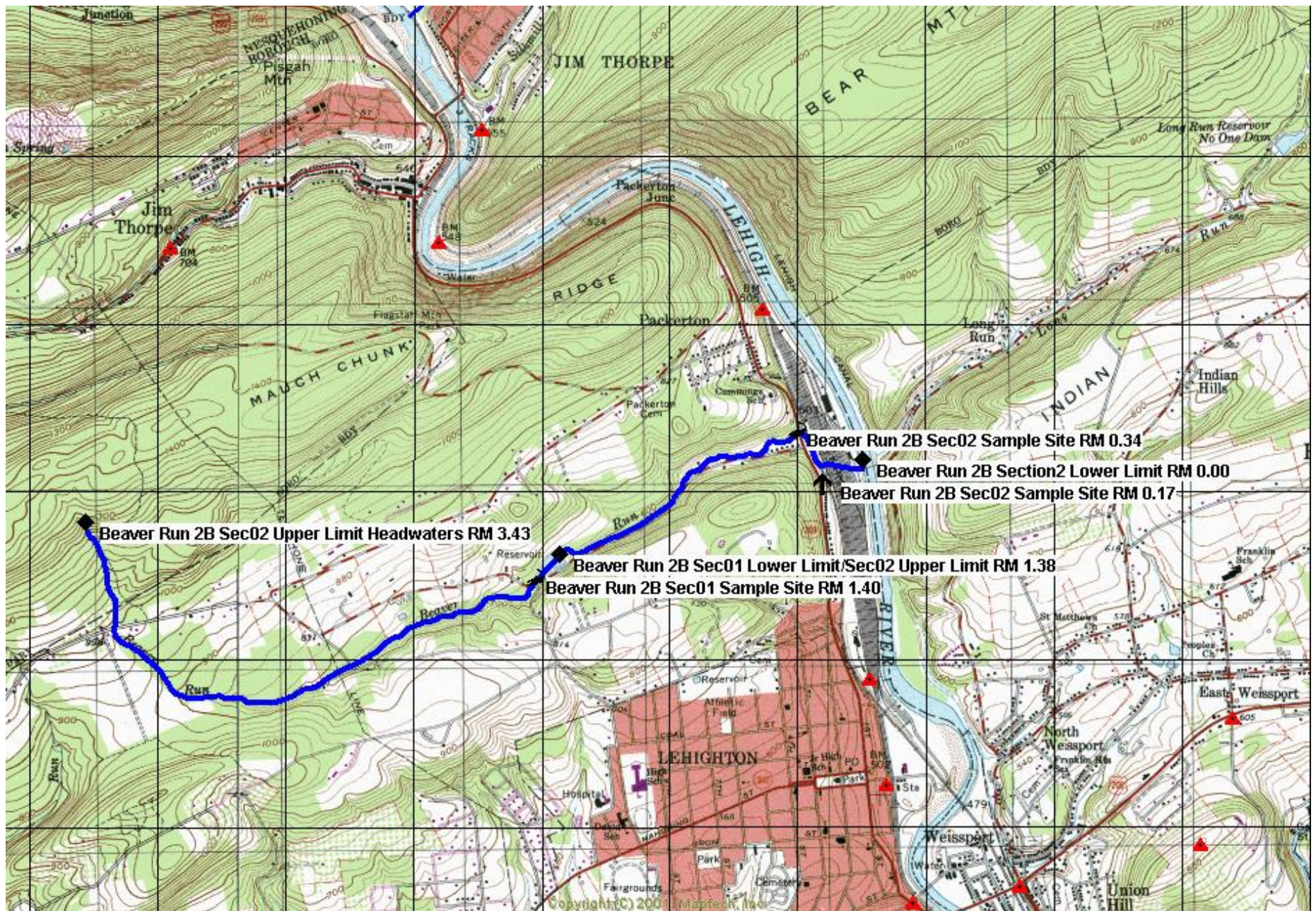


Figure 1. Location map for sample site river miles 1.40, 0.34, and 0.17 on Beaver Run (502B), Carbon County; USGS Topographic Maps - Nesquehoning and Lehigh, PA.