

DEP Stream Code: 10602

Middle Spring Creek

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Middle Spring Creek Watershed Association
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WATER: Middle Spring Creek (707B) Cumberland County

EXAMINED: August 10 and 18, 2006

BY: D.A. Miko, J.R. Frederick and A.B. Wagner

Bureau Director Action: _____ Date: _____

Division Chief Action: _____ Date: _____

WW Unit Leader Action: _____ Date: _____

CW Unit Leader Action: _____ Date: _____

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AREA COMMENTS:

Middle Spring Creek is 11.23 km (6.98 mi) in length and located in sub-subbasin 707B, Southhampton Township, forming the boundary of portions of Cumberland and Franklin Counties. Section 01 of Middle Spring Creek extends from the headwaters downstream to Avon Road. Section 02 extends from Avon Road to the mouth and is currently a Trout Stocked Fishery. Section 01 was surveyed in August 2006 at the request of the Borough of Shippensburg to determine the feasibility of expanding the Approved Trout Waters program upstream through the borough limits.

During the August 2006 survey a natural reproducing wild brown trout population in excess of a biomass estimate of 76 kg/ha was documented in Section 01 of Middle Spring Creek. Pennsylvania Fish and Boat Commission criteria require that the biomass estimate of a wild brown trout population exceed 40 kg/ha to be considered for official Class A recognition.

The water quality protection offered by the 25 PA Chapter 93 designation of CWF was determined to be inadequate to satisfactorily protect these resources. Middle Spring Creek would be more appropriately protected under the High Quality (HQ) CWF designation. This designation would not only provide protection for the propagation of coldwater fishes but would also place more stringent antidegradation requirements on any new, or increased discharges proposed for this stream.

The Class A Wild Trout population documented in Section 01 developed under Conventional Statewide Angling Regulations. Middle Spring Creek, Section 01, should continue to be managed as a Class A Wild Trout Water under Conventional Statewide Angling Regulations sustained through natural reproduction.

AREA RECOMMENDATIONS:

1. The Pennsylvania Fish and Boat Commission should manage the wild brown trout population in Middle Spring Creek with conventional, statewide angling regulations.

2. Submit Section 01 of Middle Spring Creek to the Pennsylvania Fish and Boat Commission Board of Commissioners with a recommendation for classification as a Class A Wild Trout Water from the source downstream to Avon Road (T-303). (Agenda item written by AFM Miko and submitted with report).
3. Add Section 01 of Middle Spring Creek to the Listing of Streams Having Trout Reproduction (Coldwater Unit action needed)
4. Pending Commission approval of Class A status for Section 01, a copy of this report should be provided to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Environmental Services Division for a 25 PA Code Chapter 93 upgrade from CWF to HQ-CWF from the source downstream to Avon Road (T-303) (Section 01). (Environmental Services action required through John Arway)
5. A copy of this report should be provided to the Habitat Management Division for consideration of riparian habitat restoration work near the headwaters and riparian and instream habitat work in the lower reaches of Section 01. (Habitat Management Division action required)
6. Fisheries Management Area 7 should survey Middle Spring Creek in 2007 to determine the downstream limits of the wild brown trout population.

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

Middle Spring Creek (707B)
Section 01
Management Report

Prepared by
J.R. Frederick & D.A. Miko
Fisheries Management Area 7

Fisheries Management Database Name: Middle Spring Creek
Lat/Lon: 400617/773336

Date Sampled: August 10 & 18, 2006 Date Prepared: Winter 2006

Introduction

Middle Spring Creek originates in Southhampton Township and flows in a northwesterly direction to its confluence with the Conodoguinet Creek at River Mile (RM) 70.30, 40°06'17" latitude and 77°33'36" longitude. Middle Spring Creek forms the boundary in part between Cumberland and Franklin County for its entire length. Middle Spring Creek is an 11.23 km (6.98 mi), low gradient, fertile limestone creek that is a tributary to the Conodoguinet Creek. This creek has a drainage area of 123 km² (47.49 mi²) and originates from the confluence of Furnace and Gum Run on the east side of the Borough of Shippensburg. Map coverage is provided by the Shippensburg, PA United States Geological Survey 7.5 minute quadrangles (Figure 1).

Middle Spring Creek, Section 01, was surveyed in August 2006 at the request of the Borough of Shippensburg to determine the feasibility of expanding the Approved Trout Waters program upstream through the borough limits. The stream is currently considered to be two sections for fisheries management purposes. Section 01 is 2.38 km (1.48 mi) long and includes the reach from the headwaters downstream to the Avon Road (T-303) (Table 1). Section 02 is 8.85 km (5.50 mi) long and extends from Avon Road to the mouth. Located on private property that is open to public angling, Section 02 is managed as an Approved Trout Water (Figure 1).

The underlying geology of this drainage basin is comprised of the Weaverton, Loudon, Harpers, Antietam, Tomstown, Waynesboro, Elbrook, Zullinger, Stonehenge, Rockdale Run, Pinesburg Station, Chambersburg, St. Paul Group, and Martinsburg Formations dating back to the Ordovician and Cambrian Era. The Weaverton Formation contains quartzite and quartzose conglomerate containing rounded pebbles. The Loudon Formation contains sericitic slate and

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crumbly, poorly sorted, arkosic sandstone and conglomerate. The

Harpers Formation is chiefly made of phyllite and shist containing thin quartzite layers. The Waynesboro Formation contains shale interbedded with sandstone and conglomerate. The Elbrook Formation contains calcareous shale and silty limestone at the top, limestone and dolomite in the middle and pure limestone at the base. The Zullinger Formation contains interbanded and interlaminated limestone and dolomite, thin to thick-bedded stromatolitic limestone and several thin local quartz sandstone beds. The drainage basin also contains three formations of the Beekmantown Group. They are the Stonehenge Formation, which contains stromatolitic, fine-grained limestone and coarser grained conglomeratic, siliceous laminated Stoufferstown Formation at the base in most of the Cumberland Valley; The Rockdale Run Formation, which contains mostly limestone, some dolomite interbeds, chert near the middle and top, stromatolitic limestone in the middle, marbleoid limestone and chert at the base; and the Pinesburg Station Formation, which contains thick-bedded finely laminated dolomite, and some limestone (Socolow 1980).

The Department of Environmental Protection (DEP) 25 PA Code Chapter 93 Water Quality Standards designate the Middle Spring Creek basin from the source to the confluence of the Conodoguinet Creek as Cold Water Fishes (CWF). The CWF designation requires that any permitted discharges into the stream meet effluent criteria designed to provide maintenance or propagation, or both, of fish species including the family Salmonidae and additional flora and fauna which are indigenous to a cold water habitat.

The Pennsylvania Fish and Boat Commission (PFBC) has no record of previous sampling in the current Section 01.

Section 02 has been historically stocked with brown trout *Salmo trutta*, brook trout *Salvelinus fontinalis* and rainbow trout *Oncorhynchus mykiss* by the PFBC. This section has also been stocked with adult trout by the Shippensburg Fly Fishing Club, which operates a PFBC Cooperative Nursery located at Dykeman Springs. Surveys conducted in 1978 in Section 02 characterized this section as a high alkalinity, transitional, cold water fishery with no reproduction of trout.

Methods

The examination of Middle Spring Creek, Section 01, was conducted on August 10 and 18, 2005. All protocols were carried out according to those outlined by Marcinko et al. (1986). Two representative and historic sampling stations totaling 27% of the section length were sampled. Physical characteristics, physicochemical properties, aquatic macroinvertebrates, and the fish community were evaluated at Stations 0101 and 0102.

Aquatic macroinvertebrates were collected with a kick screen and by hand gleaning rocks. Macroinvertebrates were generally identified in the field to the family level and assigned pollution tolerance index values according to a combination of those developed by or through Illinois EPA (1989), EA Mid-Atlantic Regional Operations Engineering, Science and Technology, Inc. (1990), Klemm et al. (1990), RMC Environmental Services,

Inc. (1991), and PFBC field experience. Aquatic macroinvertebrates unidentified in the field were preserved in a solution of 90% isopropyl alcohol and brought to the PFBC Area 7 Fisheries Management office for identification.

Fish sampling gear consisted of a TAS (Model QEG 300) backpack alternating current generator and a Coffelt (Model BP-1C) variable voltage electrofisher operated at 75 VAC, which produced 75 Watts. All fish captured that exceeded 25 mm were identified, recorded for species occurrence, and released at the site of capture. Trout were identified as being of wild or hatchery origin. Trout were measured and recorded in 25 mm (1.0 in.) length groups with weights (g) taken from up to 10 individuals per size group when available. Statewide average weights calculated for each length group for each species were supplemented when necessary. Wild trout were given an upper caudal fin clip during the initial electrofishing pass to facilitate a mark-recapture population estimate using the Chapman modification of the Petersen estimator or M+C-R when R was less than three. Scientific and common fish names follow Bailey et al. (1991). Relative fish species abundance per 300 m of stream length was assigned to all fish species collected based on the following criteria: > 100 = abundant, 26 - 100 = common, 3 - 25 = present, < 3 = rare. In instances where station length was less than 300 m the number of fish was extrapolated to a 300 m equivalent.

Habitat assessment was completed by the use of the 10 parameter Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers developed by the Environmental Protection Agency (EPA). This assessment was used to provide a basis for documenting and determining the extent that habitat is a limiting factor (Barbour et. al. 1999).

Results

Station 0101

Station 0101 was located at a small low head dam at Valley Quarries Inc. on West Garfield Street at RM 6.33 (latitude 40° 02' 49" and longitude 77° 31' 14"; Table 2 and Figure 1). The 310 m long station averaged 6.94 m wide and was located in an urban setting, which included business, residential and recreational uses. Shrubs in the riparian zone provided moderate shading of the stream. Stream bank erosion was moderate to heavy. Habitat for fish within the station consisted of pools up to 0.50 m deep separated by long shallow riffles up to 0.20 m deep. The substrate was unconsolidated and consisted primarily of gravel. Rubble and sand were also present in the substrate to a lesser extent.

The RBP analysis yielded a score of 147 out of a total possible score of 200. Suboptimal ratings were assigned to embeddedness, sediment deposition, channel alteration, left bank stability and left bank vegetative protection. The left bank riparian vegetative zone widths were assigned a poor rating (Table 3).

Physicochemical parameters and their associated values measured

on August 10, 2006, under normal flow conditions were as follows: air temperature 24.5°C, water temperature 13.8°C, pH 7.3 standard units, total alkalinity 154 mg/l, total hardness 196 mg/l, specific conductance 347 umhos and dissolved oxygen 9.2 mg/l (Table 4).

Aquatic macroinvertebrate diversity at Station 0101 was fair with 7 taxa in the collection (Table 5). The collection included one mayfly family, one stonefly family, two midge families and one water bug family. All macroinvertebrates that were collected were considered pollution tolerant.

A total of ten fish species were captured at Station 0101 (Table 6). Fish common in a coldwater environment to fish common in an environment transitional between coldwater and warmwater were collected (Steiner 2000) and included the following: brook trout, brown trout, rainbow trout, sculpins *Cottus sp.*, blacknose dace *Rhinichthys atratulus*, white sucker *Catostomus commersoni*, bluegill *Lepomis macrochirus*, pearl dace *Margariscus margarita*, pumpkinseed *Lepomis gibbosus* and creek chub *Semotilus atromaculatus*. The estimated wild brown trout biomass was 96.15 kg/ha (Table 7).

Station 0102

Station 0102 was located 100 meters downstream of the Springhouse Road bridge at RM 5.72 (latitude 40° 03' 14" and longitude 77° 31' 33"; Table 2 and Figure 1). The 330 m long station averaged 8.45 m wide and was located in an urban setting, which included business, residential, and recreational uses. Trees and shrubs in the riparian zone provided limited shading of the stream. Stream bank erosion was moderate. Habitat for fish within the station consisted of pools up to 0.50 m deep separated by short to long shallow riffles up to 0.20 m deep. The substrate was unconsolidated and consisted primarily of gravel and rubble. Sand comprised a small portion of the substrate mix.

The RBP analysis yielded a final score of 143. Suboptimal ratings were assigned to embeddedness, sediment deposition, channel alteration and left bank vegetative protection. The left and right bank riparian vegetative zone widths were assigned poor and marginal ratings, respectively (Table 3).

Physicochemical parameters and their associated values measured on August 10, 2006, under normal flow conditions were as follows: air temperature 25.0°C, water temperature 15.5°C, pH 7.6 standard units, total alkalinity 162 mg/l, total hardness 200 mg/l, specific conductance 362 umhos and dissolved oxygen 9.6 mg/l (Table 4).

Aquatic macroinvertebrate diversity at Station 0102 was fair with 11 taxa in the collection (Table 5). The collection included one caddisfly family, three midge families, one water beetle family and one water bug family. Macroinvertebrates that were collected were considered pollution tolerant.

A total of eleven fish species were captured at Station 0102

(Table 6). Fish common in a coldwater environment to fish common in an environment transitional between coldwater and warmwater were collected. They included the following: brook trout, brown trout, rainbow trout, sculpins, blacknose dace, bluegill, creek chub, pearl dace, pumpkinseed, white sucker and longnose dace *Rhinichthyys cataractae*. The estimated wild brown trout biomass was 57.07 kg/ha (Table 8).

Section 01

Middle Spring Creek, Section 01, can be characterized as a high alkalinity limestone stream draining the Cumberland valley.

The RBP provided insight to potential habitat limitations of Section 01 in terms of riparian vegetative zone widths and vegetative protection. Section 01 would benefit from riparian habitat improvements.

The physicochemical values of total alkalinity, hardness and pH were indicative of the limestone geology of the region. The physicochemical values indicated that the stream possessed sufficient buffering capacity against the effects of acid precipitation and runoff.

The aquatic macroinvertebrate community, which is indicative of long-term water quality, was found to be pollution tolerant. A total of 12 macroinvertebrate taxa of were collected. The diversity of taxa found was good considering this is a limestone influenced stream, where diversity is typically relatively low.

A total of eleven unique fish species were captured in Section 01. Fish common in coldwater environments to fish common in environments transitional between coldwater and warmwater were collected. The 2006 survey documented a dense wild brown trout population in Section 01 of Middle Spring Creek. The mean wild brown trout biomass was 76.6 kg/ha, total biomass of brown trout less than 150 mm was 17.0 kg/ha and brown trout made up 100% of the total wild trout biomass (Table 9). The estimated abundance of legal size (> 7 inches) wild brown trout was 210/km. Based on a section length of 2.38 km (1.5 mi) this translated into an estimated total of 500 legal size wild brown trout ranging from seven to nineteen inches in length in Section 01 of Middle Spring Creek (Table 9).

Discussion

The Middle Spring Creek, Section 01, biomass estimate exceeded the PFBC minimum criteria for a Class A wild brown trout fishery. These criteria are as follows: total brown trout biomass of at least 40 kg/ha, total biomass of brown trout less than 150 mm total length of at least 0.1kg/ha and total brown trout biomass must comprise at least 75% of the total trout biomass.

After Commission approval of Class A status for Section 01 and subsequent approval of a 25 PA Code Chapter 93 upgrade from CWF to HQ-CWF by DEP, Middle Spring Creek will be more adequately protected from the potential negative effects of future

discharges and encroachments.

The Class A Wild Trout population documented in Section 01 developed under Conventional Statewide Angling Regulations. Middle Spring Creek, Section 01, should continue to be managed as a Class A Wild Trout Water under Conventional Statewide Angling Regulations sustained through natural reproduction.

Stream Resource Classification

Physical

Biomass Class:	A (brown trout)
Total Biomass:	Brown 76.6 kg/ha (2006)
Biomass < 150 mm:	Brown 17.0 kg/ha (2006)

Social

Human Population Density:	Suburban 94/km ² (2000)
Width Class:	3 (7.7 m)
Ownership:	Public 13 % (Borough) Private 87%
Road Accessibility:	Within 100 m - 100%

Management Recommendations

- 1 The Pennsylvania Fish and Boat Commission should manage the wild brown trout population in Middle Spring Creek with conventional, statewide angling regulations.
2. Submit Section 01 of Middle Spring Creek to the Pennsylvania Fish and Boat Commission Board of Commissioners with a recommendation for classification as a Class A Wild Trout Water from the source downstream to Avon Road (T-303). (Agenda item written by AFM Miko and submitted with report).
3. Add Section 01 of Middle Spring Creek to the Listing of Streams Having Trout Reproduction (Coldwater Unit action needed)
4. Pending Commission approval of Class A status for Section 01, a copy of this report should be provided to the Pennsylvania Department of Environmental Protection through the Pennsylvania Fish and Boat Commission's Environmental Services Division for a 25 PA Code Chapter 93 upgrade from CWF to HQ-CWF from the source downstream to Avon Road (T-303) (Section 01). (Environmental Services action required through John Arway)
5. A copy of this report should be provided to the Habitat Management Division for consideration of riparian habitat restoration work near the headwaters and riparian and instream habitat work in the lower reaches of Section 01. (Habitat Management Division action required)
6. Fisheries Management Area 7 should survey Middle Spring Creek in 2007 to determine the downstream limits of the wild brown trout population.

Literature Cited

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Table 1. Physical characteristics of Middle Spring Creek (707B) Section 01, Cumberland and Franklin Counties.

Physical Characteristics	Description
USGS Quadrangles	R25 - Shippensburg, PA
Section Limits	UPS - Headwaters 40 ⁰ 02' 22" / 77 ⁰ 31' 10" DNS - Avon Road (T-303) 40 ⁰ 09' 24" / 77 ⁰ 31' 43"
Length	2.38 km
Mean Width	7.70 m
Area	1.83 ha

Table 2. Station locations, lengths and average widths for Section 01 of Middle Spring Creek (707B), Cumberland and Franklin Counties surveyed August 2006.

Station	Downstream Limit Description	Length (m)	Ave. Width (m)
0101	Low head dam at Valley Quarries Inc. on West Garfield Street	310	6.94
0102	100 m downstream of bridge on Springhouse Road	330	8.45

Table 3. Rapid Bioassessment Protocol ratings for Middle Spring Creek (707B), Cumberland and Franklin Counties conducted in August 2006.

Habitat Parameter	Condition Score		Condition Rating	
	0101	0102	0101	0102
Epifaunal Substrate	18	16	Optimal	Optimal
Embeddedness	12	12	Suboptimal	Suboptimal
Velocity/Depth Regime	17	16	Optimal	Optimal
Sediment Deposition	13	14	Suboptimal	Suboptimal
Channel Flow Status	18	18	Optimal	Optimal
Channel Alteration	13	14	Suboptimal	Suboptimal
Frequency of Riffles/bends	16	18	Optimal	Optimal
Bank Stability (R/L)	R9-L6	R9-L9	R-Optimal L-Suboptimal	Optimal
Vegetative Protection (R/L)	R9-L5	R5-L6	R-Optimal L-Suboptimal	R-Marginal L-Suboptimal
Riparian Vegetative Zone Width (R/L)	R9-L2	R4-L2	R-Optimal L-Poor	R-Marginal L-Poor
Total Score	147	143		

Table 4. Physicochemical parameters and their associated values measured in Middle Spring Creek (707B), Section 01, Cumberland and Franklin Counties, surveyed 2006.

Parameter	Station	
	0101	0102
Date	08/18/06	08/18/06
Time (24 hour)	1001	1345
Air temperature (°C)	24.5	25.0
Water temperature (°C)	13.8	15.5
pH (standard units)	7.3	7.6
Specific conductance (umhos)	347	362
Total alkalinity (mg/l)	154	162
Total hardness (mg/l)	196	200
Dissolved oxygen (mg/l)	9.2	9.6

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Table 5. Aquatic macroinvertebrate taxa collected from Middle Spring Creek (707B) in August 2006.

Taxon	Station 0101	Station 0102	PTI
Ephemeroptera			
Baetidae	x		7
Coleoptera			
Gyrinidae		x	NA
Tricoptera			
Hydropsychidae	x	x	4-8
Diptera			
Chironomini	x	x	10
Other Chironomids	x	x	0-10
Tipulidae		x	4
Hemiptera			
Gerridae		x	NA
Decapoda			
Cambaridae	x	x	6
Amphipoda			
Gammaridae	X	x	2-8
Tricladida			
Planariidae	X	x	10
Class Oligochaeta		x	10
Isopoda			
Asellidae		x	8
Total taxa	7	11	

X = Present at Station. PTI = Pollution Tolerance Index. PTI ranges from 0 (very intolerant of pollution) to 10 (very tolerant of pollution). NA = not available.

Table 6. Fish species occurrence and relative abundance in Middle Spring Creek (707B), Section 01, determined by backpack electrofishing August 2006.

Common Name	Scientific Name	Station 0101	Station 0102	Thermal Tolerance
Blacknose Dace	<i>Rhinichthys atratulus</i>	A	A	ColdTrans
Bluegill	<i>Lepomis macrochirus</i>	R	R	Warm
Brook Trout-Hatchery	<i>Salvelinus fontinalis</i>	R	R	Cold
Brown Trout	<i>Salmo trutta</i>	A	A	ColdTrans
Creek Chub	<i>Semotilus atromaculatus</i>	P	C	Cool
Longnose Dace	<i>Rhinichthys cataractae</i>		P	ColdTrans
Pearl Dace	<i>Margariscus margarita</i>	A	C	N/A
Pumpkinseed	<i>Lepomis gibbosus</i>	R	P	N/A
Rainbow Trout-Hatchery	<i>Oncorhynchus mykiss</i>	R	R	Cold
Sculpins	<i>Cottus sp.</i>	C	C	Cold
White Sucker	<i>Catostomus commersoni</i>	C	A	N/A
Total Species		10	11	

Subjective Abundance Index
(based on a 300 m long station):

A = Abundant (> 100)

C = Common (26 - 100)

P = Present (3 - 25)

R = Rare (< 3)

Thermal Tolerance Ratings

Cold = Coldwater Fish

ColdTrans = Coldwater Transition Fish

Cool = Coolwater Fish

CoolTrans = Coolwater Transition Fish

Warm = Warmwater Transition Fish

Table 7. Estimated abundance and biomass of wild brown trout from Middle Spring Creek (707B), using a Petersen estimator. Station located at River Mile 6.33 (Station 0101) with a station Lat/Lon of 400249/773114. Station currently located within section 01. Survey Date: 8/18/2006.

Size Group	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	120	54	300	558	6.47	387
100	74	44	131	344	7.02	239
125	4			19	0.45	13
150	2			9	0.39	6
175	16	7	40	74	5.80	52
200	21	12	40	98	10.51	68
225	10	5	22	46	7.29	32
250	4			19	3.66	13
275	2			9	2.57	6
300	6	2	15	28	8.70	19
325	2			9	3.80	6
350	2			9	5.13	6
375	2			9	4.80	6
425	2			9	8.20	6
450	3			14	14.39	10
475	1			5	6.97	3
Totals:	271			1,259	96.15	872

Table 8. Estimated abundance and biomass of wild brown trout from Middle Spring Creek (707B), using a Petersen estimator. Station located at River Mile 5.72 (Station 0102) with a station Lat/Lon of 400314/773133. Station currently located within section 01. Survey Date: 8/18/2006.

Size Group	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
75	149	103	224	534	6.20	452
100	176	127	251	631	12.88	533
125	11			39	0.96	33
150	4			14	0.61	12
175	19	10	39	68	5.32	58
200	20	13	33	72	7.73	61
225	8	3	19	29	4.50	24
250	2			7	1.41	6
275	6			22	5.94	18
300	3			11	3.36	9
325	3			11	4.40	9
375	1			4	1.85	3
400	1			4	1.91	3
Totals:	403			1,446	57.07	1,221

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Abundance statistics for wild brown trout by electrobackpack in Middle Spring Creek Section 01, section located within Pennsylvania drainage sub-subbasin 7B. Two stations (n) were used in this survey with station collection dates of 8-18-2006.

25mm Size Group	CPUE	Population Estimate	Est Num/Ha	Est Kg/Ha	Est Num/Km	n Sites
75	59.83	135	546	6.34	419	2
100	56.42	125	488	9.95	386	2
125	3.58	8	29	0.71	23	2
150	4.16	3	12	0.50	9	2
175	14.56	18	71	5.55	55	2
200	22.61	21	85	9.12	64	2
225	7.15	9	38	5.89	28	2
250	3.58	3	13	2.54	9	2
275	4.08	4	15	4.25	12	2
300	3.58	5	19	6.02	14	2
325	2.83	3	10	4.10	8	2
350	0.75	1	5	2.56	3	2
375	1.50	2	6	3.33	5	2
400	0.67	1	2	0.96	2	2
425	1.50	1	5	4.10	3	2
450	1.50	2	7	7.20	5	2
475	0.75	1	2	3.48	2	2
	189.05	342	1,353	76.6	1,047	

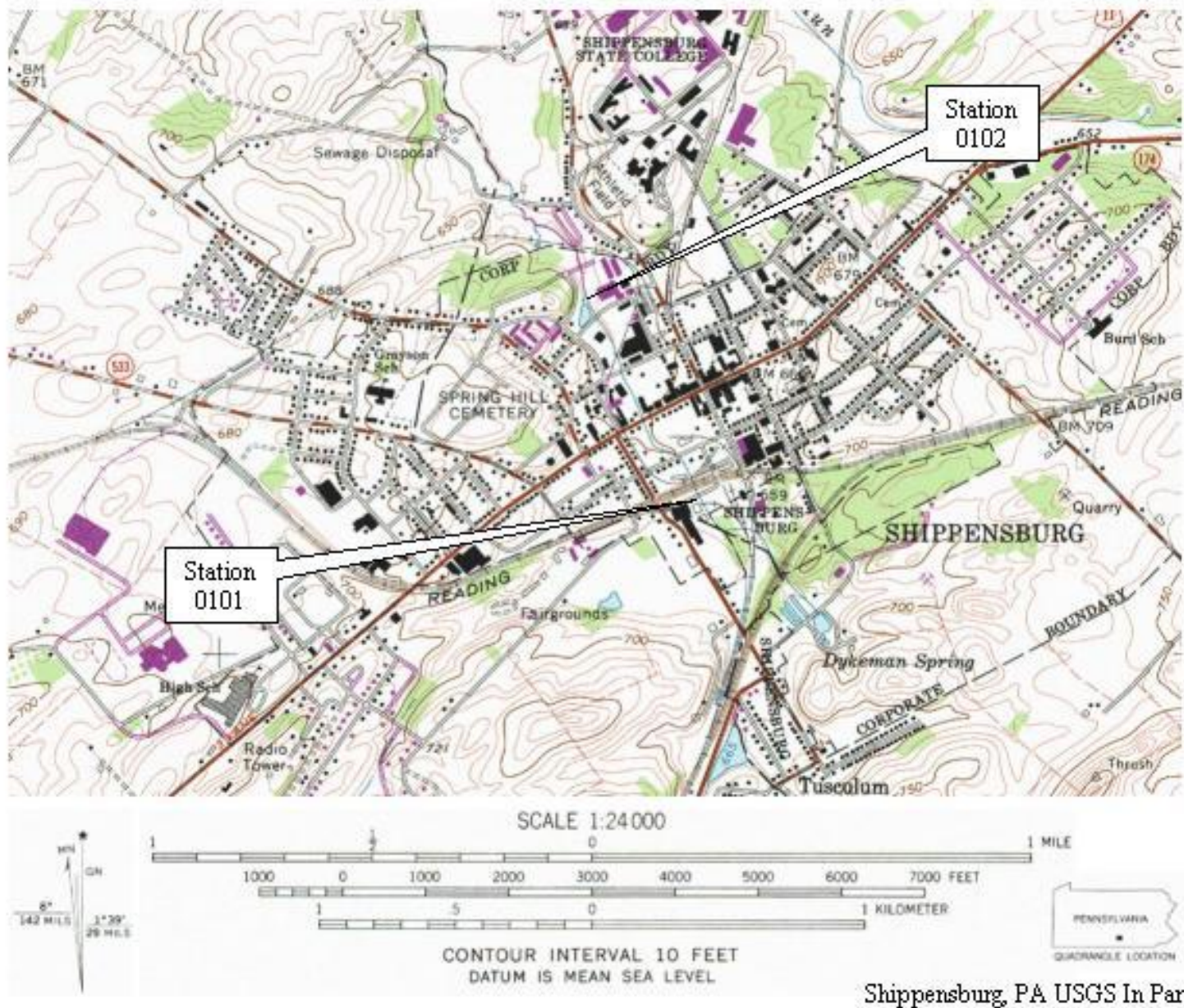


Figure 1. Location map for Middle Spring Creek (707B) Section 01, Cumberland and Franklin Counties.