

# **SWIFTWATER CREEK**

**MONROE COUNTY**

## **WATER QUALITY STANDARDS REVIEW STREAM REDESIGNATION EVALUATION REPORT**

**Segment: Basin, Source to Unnamed Tributary (UNT) 04960  
Stream Code: 04954  
Drainage List C**

**WATER QUALITY MONITORING SECTION (MAB)  
DIVISION OF WATER QUALITY STANDARDS  
BUREAU OF CLEAN WATER  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**February 2016**

## **INTRODUCTION**

The Swiftwater Creek basin is currently designated High Quality - Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) and was evaluated for a redesignation to Exceptional Value (EV) in response to a petition from the Brodhead Creek Watershed Association dated July 2, 2007. The petitioner requested redesignation of the Swiftwater Creek basin, from its source to State Route (SR) 611, asserting that the existing aquatic life use of the basin is of higher quality than is represented by the current HQ-CWF, MF designation. The Environmental Quality Board (EQB) accepted the petition for further study on October 16, 2007. The Department conducted aquatic life use and stream survey work in the Swiftwater Creek basin May 1 – 2, 2008.

## **GENERAL WATERSHED DESCRIPTION**

Swiftwater Creek, source to SR 611, is a relatively small, cold and shallow third-order tributary to Forest Hills Run at RMI 0.1 located in Pocono and Tobyhanna Townships and Mount Pocono Borough, Monroe County and drains 6.46 square miles (Figure 1). Swiftwater Creek is located on the Mount Pocono and Pocono Pines 7.5-minute series USGS quadrangle maps. Land use consists of 70% forested land, 14% low density residential, 13.6% agricultural lands and approximately 2.4% wetlands or other. The majority of the petitioned area is within the privately owned The Inn at Pocono Manor property.

## **WATER QUALITY AND USES**

### **Surface Water**

No long-term water quality data were available from the Swiftwater Creek basin that would allow a direct comparison to water quality criteria. The Department did collect chemical and biological data from the Swiftwater Creek study area during site visits in May and July 2008. Despite the limitations of water chemistry grab samples, these observations can provide an overview of Swiftwater Creek's water quality. Water chemistry grab samples and field data collected May 1 and July 21, 2008 at 1SC, 2IR, and 3SC within the petitioned basin revealed good water quality (Table 2).

There is one permitted surface water withdrawal, one permitted sewage treatment plant discharge, and one industrial storm water discharge to the petitioned Swiftwater Creek basin.

### **Aquatic Biota**

The indigenous aquatic community is an excellent indicator of long-term conditions and is used as a measure of water quality. Department staff collected habitat and benthic macroinvertebrate data at three Swiftwater Creek basin locations and at one EV reference station on Dimmick Meadow Brook May 1 – 2, 2008 (Table 1, Figure 1).

**Habitat.** Instream habitat was assessed at each of the three stations where benthic macroinvertebrates were sampled within the petitioned basin as well as at the Dimmick Meadow Brook EV reference station. The habitat scores for the three Swiftwater Creek basin stations ranged from 212 to 229, reflecting optimal habitat conditions (Table 3).

**Benthos.** Benthic macroinvertebrate samples were collected for this petition evaluation using the Department's PA-DEP RBP benthic sampling methodology (Plafkin, et al. 1989; Barbour et al. 1999). Benthic samples were collected from three stations in the Swiftwater Creek basin and one on Dimmick Meadow Brook May 1 – 2, 2008. Taxa richness, modified Ephemeroptera Plecoptera Trichoptera (EPT) index, Hilsenhoff Biotic Index (HBI), and % dominant taxa metrics for stations 1SC and 2IR were very similar to those of the reference station DMB. Candidate station 3SC had lower taxa richness, lower modified EPT index, higher modified HBI, and higher % dominant taxon metric values (Table 5). The dominant taxon at 3SC was Chironomidae, a pollution tolerant invertebrate directly responsible for elevated HBI and % dominant metric values.

## **BIOLOGICAL USE QUALIFICATIONS**

The biological use qualifying criterion applied to the petitioned Swiftwater Creek basin was the DEP integrated benthic macroinvertebrate scoring test described at 25 Pa. Code §93.4b(b)(1)(v). Selected benthic macroinvertebrate community metrics from the petitioned basin stations were compared to those from the reference stream station. The reference station on Dimmick Meadow Brook was used as a reference because it is within the same Atlantic Highland ecoregion and has comparable drainage area to the candidate stations. In addition, Dimmick Meadow Brook has served as an EV reference stream in other Departmental surveys. The comparisons were done using the following metrics that were selected as being indicative of community health: taxa richness, modified EPT index, modified Hilsenhoff Biotic Index, percent dominant taxon, and percent modified mayflies.

Based on the benthic macroinvertebrate scoring test described above, two stations, 1SC and 2IR had Biological Condition Scores (BCS) that were above the 92% EV qualifying criterion required to qualify as Exceptional Value Waters (§ 93.4b(b)(1)(v)) (Table 5). No other Antidegradation qualifying requirements listed in § 93.4b apply to the Swiftwater Creek petition area.

## **PUBLIC RESPONSE AND PARTICIPATION SUMMARY**

The Department provided public notice of this designation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on May 12, 2012 (42 Pa.B. 2539). In addition, the Monroe County Planning Commission, Tobyhanna, Pocono, and Paradise Townships were notified of the designation evaluation in a letter dated May 14, 2010. No other data were received resulting from the public notice. The Department received notice from Tobyhanna Township stating they do not support the petition to upgrade Swiftwater Creek. The Department has received a letter of support from the office of Senator Lisa M. Boscola.

**Final Draft Notice, Comments and Response.** Once the final draft report was completed, it was made available to the petitioner, all municipalities, County Planning Commissions, County Conservation Districts and other State Agencies on September 4, 2015 with a public comment period ending 45-days later. No comments were received in response to this notice.

## **RECOMMENDATION**

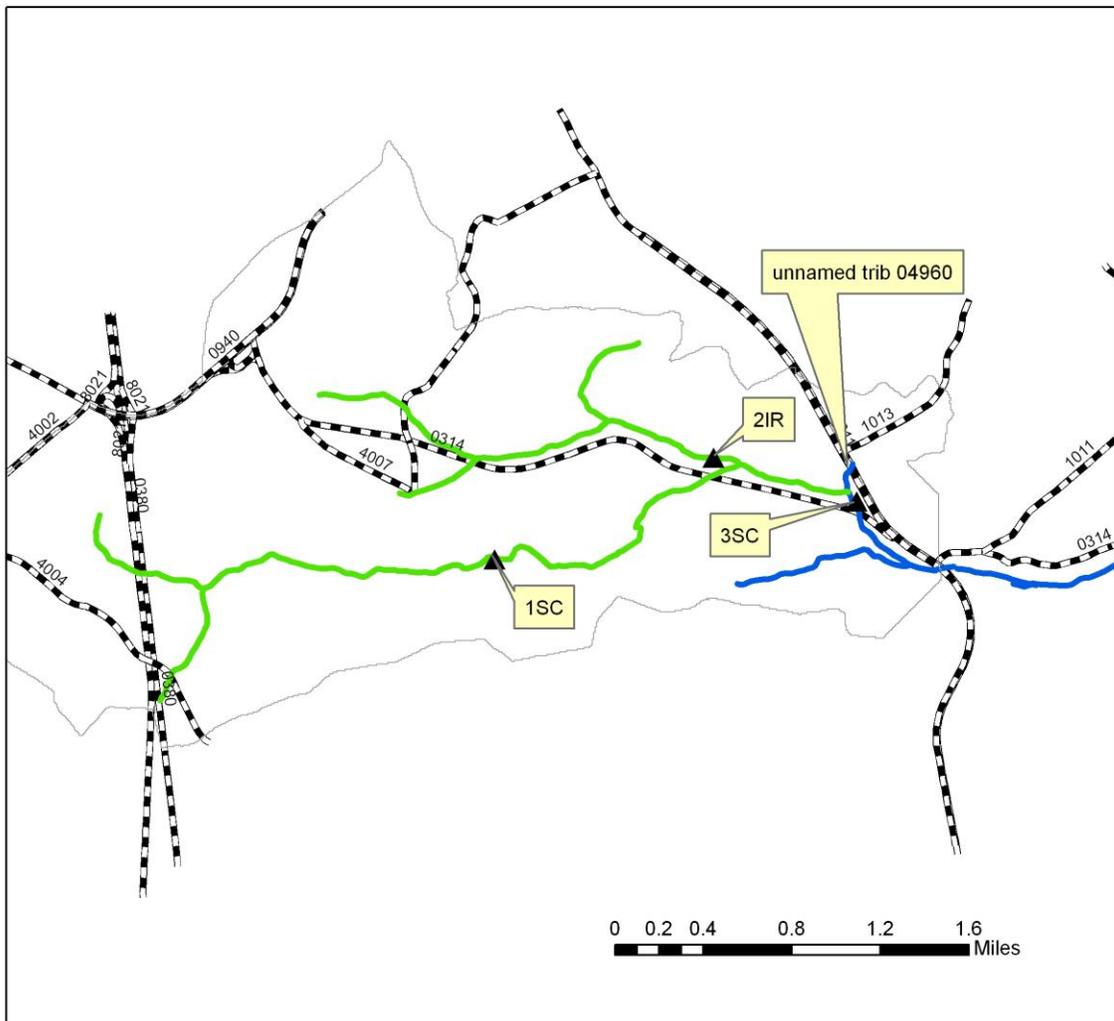
Based on applicable regulatory definitions and requirements of § 93.4b, the Department recommends that the Swiftwater Creek basin, from its source to UNT 04960, be designated in Chapter 93 as Exceptional Value, Migratory Fishes (EV,MF). This recommendation is based on biological condition scores greater than 92% of the reference station score (§93.4b(b)(1)(v)). This recommendation affects approximately 7.69 miles of stream and reflects the EV designation sought in the petition.

## REFERENCES

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water; Washington, D.C.

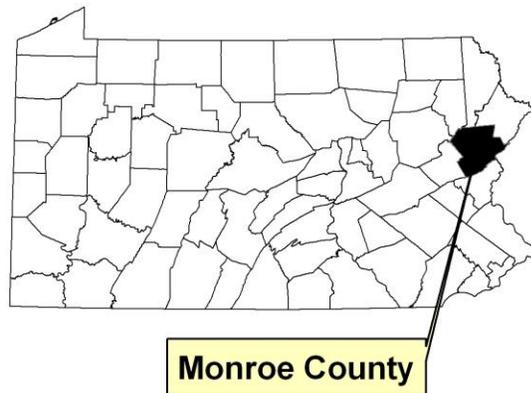
Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. Environmental Protection Agency, Office of Water Regulation and Standards, Washington, D.C. EPA 440-4-89-001.

**FIGURE 1**  
**SWIFTWATER CREEK, MONROE COUNTY**



**Legend**

-  Petitioned Basin
-  Swiftwater Creek - EV
-  Swiftwater Creek - HQ-CWF
-  State Roads



**TABLE 1  
STATION LOCATIONS  
SWIFTWATER CREEK, MONROE COUNTY  
DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)**

<u>Station</u>	<u>Location</u>
1SC:	Swiftwater Creek on The Inn at Pocono Manor Resort Property. 75°21'56.954"W 41°5'45.151"N
2IR:	Indian Run upstream from confluence with Swiftwater Creek. 75°20'47.62"W 41°6'7.494"N
3SC:	Swiftwater Creek, 50 meters upstream from SR 314 Bridge. 75°20'3.434"W 41°5'56.221"N
DMB:	Dimmick Meadow Brook, 50 meters upstream of Schocopee Rd. 75°50'9.42 41°20'57.81"N

**TABLE 2**  
**WATER CHEMISTRY**  
**SWIFTWATER CREEK, MONROE COUNTY**  
**DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)**  
**MAY 1 - 2, 2008**

<b>FIELD PARAMETER</b>	<b>UNITS</b>	<b>1SC</b>	<b>2IR</b>	<b>3SC</b>	<b>UNT 04960*</b>	<b>DMB</b>
pH	su	6.55	6.78	7.28	7.03	5.78
Alkalinity	mg/l	8	8	12	36	4
Specific Conductance	umhos	79	114	104	308	62
Diss. O2	mg/l	11.26	10.75	10.8	8.72	10.49
<b>FIELD PARAMETER</b>	<b>UNITS</b>	<b>1SC</b>	<b>2IR</b>	<b>3SC</b>	<b>UNT 04960*</b>	<b>DMB</b>
pH(Lab)	su		7.1	6.9		
Alkalinity(Lab)	mg/l		9	7.8		
Hot Acidity	mg/l		-5.6	-8.8	-31.4	
Total Hardness	mg/l		35	24	87	
Total Dissolved Solids @105 C	mg/l		114	102	310	
Total Suspended Solids	mg/l		<5	<5	<5	
Ammonia-N T	mg/l		<.02	<.02	<.02	
Nitrite-N	mg/l		<0.01	<.01	<.01	
Nitrate-N	mg/l		0.5	0.41	1.78	
Total P	mg/l		<.01	<.01	0.029	
Total Ca	mg/l		9.439	6.55	24.7	
Total Mg	mg/l		2.703	1.89	6.063	
Cl	mg/l		41.2	36.4	104.4	
Total Sulfate	mg/l		<15.0	<15.0	41.3	
BOD 5 Day	mg/l				1.5	
Total Arsenic	ug/L		<3.0	<3.0	<3.0	
Dissolved Arsenic	ug/L		<3.0	<3.0	<3.0	
Total Cd	ug/L		<0.2	<0.2	<0.2	
Dissolved Cd	ug/L		<.20	<.20	<.20	
Total Cr	ug/L		<50	<50	<50	
Total Cu	ug/L		<4.0	<4.0	<4.0	
Dissolved Cu	ug/L		<4.0	<4.0	<4.0	
Total Fe	ug/L		<20.0	<20.0	<20.0	
Total Pb	ug/L		<1.0	<1.0	<1.0	
Dissolved Pb	ug/L		<1.0	<1.0	<1.0	
Total Mn	ug/L		<10.0	<10.0	49	
Total Ni	ug/L		<4.0	<4.0	<4.0	
Dissolved Ni	ug/L		<4.0	<4.0	<2.0	
Total Zn	ug/L		5.8	<5.0	<5.0	
Dissolved Zn	ug/L		<5.0	<5.0	<5.0	
Total Al	ug/L		13.4	18.7	12.4	

\* UNT 04960 collected on 07-21-08  
< Concentrations below the reporting limit.

**TABLE 3  
HABITAT ASSESSMENT SUMMARY  
SWIFTWATER CREEK, MONROE COUNTY  
DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)  
MAY 1 - 2, 2008**

PARAMETER	Scoring Range	STATIONS			
		1SC	2IR	3SC	DMB
1. instream cover	0-20	20	20	18	18
2. epifaunal substrate	0-20	19	19	19	19
3. embeddedness	0-20	19	17	16	18
4. velocity/depth	0-20	18	18	20	15
5. channel alterations	0-20	20	20	20	20
6. sediment deposition	0-20	20	18	18	20
7. riffle frequency	0-20	20	19	17	20
8. channel flow status	0-20	20	20	20	20
9. bank condition	0-20	19	15	15	20
10. bank vegetative protection	0-20	18	17	15	20
11. grazing/disruptive pressures	0-20	20	20	20	20
12. riparian vegetation zone width	0-20	16	20	14	20
<b>Total Score</b>	0-240	229	223	212	230
<b>Rating<sup>1</sup></b>		OPT	OPT	OPT	OPT

<sup>1</sup> OPT=Optimal (≥192); SUB=Suboptimal (132-192)

**TABLE 4**  
**SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA**  
**SWIFTWATER CREEK, MONROE COUNTY**  
**DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)**  
**MAY 1 - 2, 2008**

TAXA		1SC	2IR	3SC	DMB
<b>EPHEMEROPTERA (MAYFLIES)</b>					
Ameletidae	<i>Ameletus</i>				1
Baetidae	<i>Acentrella</i>			4	
	<i>Acerpenna</i>	8			
	<i>Baetis</i>	9	9	3	11
	<i>Dipheter</i>		5		2
Ephemerellidae	<i>Drunella</i>	12	13	1	
	<i>Ephemerella</i>	10	14	7	17
Heptageniidae	<i>Cinygmula</i>	1		2	2
	<i>Epeorus</i>	28	31	4	28
	<i>Leucrocuta</i>				2
	<i>Maccaffertium</i>	1			
Leptophlebiidae	<i>Habrophlebiodes</i>	7			4
	<i>Paraleptophlebia</i>	4	3	39	3
<b>PLECOPTERA (STONEFLIES)</b>					
Leuctridae	<i>Leuctra</i>	32	9		23
Nemouridae	<i>Amphinemura</i>	4	1		24
Peltoperlidae	<i>Tallaperla</i>	4			2
Perlidae	<i>Acroneuria</i>				10
Perlodidae	<i>Alloperla</i>		2		
	<i>Diploperla</i>		1	3	
	<i>Haploperla</i>	1			
	<i>Isoperla</i>	6	6		5
	<i>Malirekus</i>		1		
	<i>Sweltsa</i>	5	2		2
Pteronarcyidae	<i>Pteronarcys</i>	6	7		7
<b>TRICHOPTERA (CADDISFLIES)</b>					
Hydropsychidae	<i>Ceratopsyche</i>	1	3	5	1
	<i>Cheumatopsyche</i>			1	2
	<i>Diplectrona</i>				8
Lepidostomatidae	<i>Lepidostoma</i>	3	2		1
Molannidae	<i>Molanna</i>		1		
Odontoceridae	<i>Psilotreta</i>		1		
Philopotamidae	<i>Dolophilodes</i>	5	7	13	
Polycentropodidae	<i>Polycentropus</i>				1
Rhyacophilidae	<i>Rhyacophila</i>	11	12	3	4
Uenoidae	<i>Neophylax</i>	3		1	

**TABLE 4 (continued)**  
**SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA**  
**SWIFTWATER CREEK, MONROE COUNTY**  
**DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)**  
**MAY 1 - 2, 2008**

TAXA		1SC	2IR	3SC	DMB
<b>DIPTERA (TRUE FLIES)</b>					
Athericidae	<i>Atherix</i>	1	1		
Blephariceridae	<i>Blepharicera</i>		5		
Ceratopogonidae	<i>Bezzia</i>	1			
Chironomidae		27	63	102	40
Empididae			1		
	<i>Chelifera</i>	1			
	<i>Clinocera</i>		4	2	
Simuliidae	<i>Simulium</i>	22	9		
	<i>Prosimulium</i>	1	2	24	7
Tipulidae	<i>Antocha</i>	1	15	3	1
	<i>Dicranota</i>	1		1	
	<i>Hexatoma</i>		3	4	2
<b>COLEPTERA (BEETLES)</b>					
Elmidae	<i>Oulimnius</i>			2	
	<i>Promoresia</i>	2			2
Psephenidae	<i>Ectopria</i>				
Psephenidae	<i>Psephenus</i>				3
<b>NON-INSECT TAXA</b>					
Isopoda	<i>Stygonectes</i>			1	
Nematoda				3	
<b>SUMMARY</b>					
Total number of taxa		30	29	22	28
Total number of individuals		218	233	228	215

**TABLE 5**  
**RBP METRIC COMPARISON**  
**SWIFTWATER CREEK, MONROE COUNTY**  
**DIMMICK MEADOW BROOK, PIKE COUNTY (REFERENCE)**  
**MAY 1 - 2, 2008**

METRIC	STATIONS			REFERENCE
	1SC	2IR	3SC	DMB
<b>TAXA RICHNESS</b>	30	29	22	28
<b>Cand/Ref (%)</b>	107	104	79	
<b>Biol. Cond. Score</b>	8	8	7	8
<b>MOD. EPT INDEX</b>	17	16	10	16
<b>Cand/Ref (%)</b>	106	100	63	
<b>Biol. Cond. Score</b>	8	8	3	8
<b>MOD. HBI</b>	2.50	2.95	3.77	2.39
<b>Cand-Ref</b>	0.11	0.56	1.38	
<b>Biol. Cond. Score</b>	8	8	0	8
<b>% DOMINANT TAXA</b>	15	27	45	19
<b>Cand-Ref</b>	-4	8	26	
<b>Biol. Cond. Score</b>	8	8	0	8
<b>% MOD. MAYFLIES</b>	26	26	25	25
<b>Ref-Cand</b>	-1	-1	0	
<b>Biol. Cond. Score</b>	8	8	8	8
<b>TOTAL BIOLOGICAL CONDITION SCORE</b>	40	40	18	40
<b>% COMPARABILITY TO REFERENCE</b>	<b>100</b>	<b>100</b>	<b>45</b>	