UNNAMED TRIBUTARY TO SOUTH BRANCH CODORUS CREEK

YORK COUNTY

WATER QUALITY STANDARDS REVIEW

STREAM REDESIGNATION EVALUATION REPORT

Segment: Basin
Stream Code: 08187
Drainage List: O

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

2021

INTRODUCTION

The Department of Environmental Protection (DEP) conducted an evaluation of the Unnamed Tributary 08187 to South Branch Codorus Creek (UNTSB) in April 2008 in response to the DEP's Southcentral Regional Office requesting that the designated use be changed from Warm Water Fishes, Migratory Fishes (WWF, MF) to Cold Water Fishes, Migratory Fishes (CWF, MF). The request was based on a June 1999 Pennsylvania Fish and Boat Commission (PFBC) survey that documented a low density of wild brown trout and other flora and fauna which are indigenous to a cold water habitat (Kaufmann et al. 1999). In addition, data collected by Pennsylvania State University York Campus faculty and students also documented a healthy wild brown trout population in 2004, 2005 and 2006. Components of this evaluation include a field survey conducted by the DEP on April 25, 2008.

The stream redesignation process begins with an evaluation of the "existing uses" and the "designated uses" of a stream. "Existing uses" are water uses actually attained in the waterbody. When existing uses are determined, the stream is protected for those uses through permit or approval actions taken by the DEP. "Designated uses" are water uses identified in regulations that protect a waterbody. Candidates for stream redesignation may be identified by the DEP based on routine waterbody investigations or based on requests initiated by other agencies or from the general public through a rulemaking petition to the state Environmental Quality Board.

GENERAL WATERSHED DESCRIPTION

UNTSB is a small, cold and shallow second-order tributary that originates west of New Freedom and flows in a northerly direction until emptying into South Branch Codorus Creek at river mile 17.69 in Shrewsbury Township, York County (Glen Rock and New Freedom 7.5-minute series USGS quadrangle). The UNTSB basin drains 2.95 square miles and contains 5.01 stream miles. The land use for the basin is 55% agricultural, 42% forested and 2% urban. Two candidate stations and a reference station were sampled as part of this survey (Figure 1, Table 1).

WATER QUALITY AND USES

Surface Water

Biological data were collected to evaluate water quality conditions in the UNTSB basin since the indigenous aquatic community is a better indicator of long-term water quality conditions. There are no active National Pollution Discharge Elimination System (NPDES) permits and no active surface water withdrawals within the basin. One permitted potable water well source is located in the headwaters.

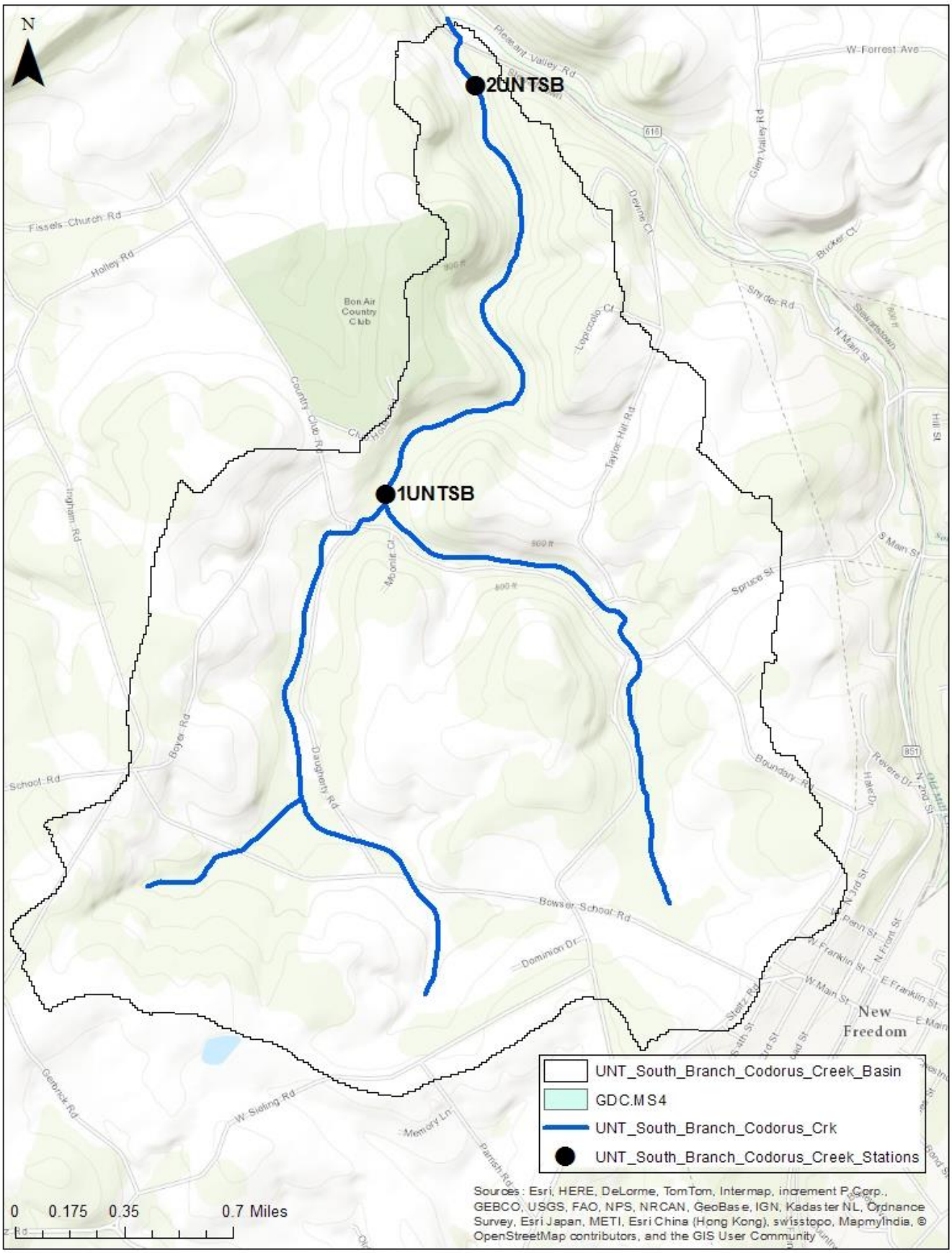

Figure 1. UNT 08187 South Branch Codorus Creek – Station Locations

Table 1. UNT 08187 South Branch Codorus Creek Basin – Station Locations

STATION	LOCATION
1UNTSB	UNT 08187 to South Branch Codorus Creek, approximately 30 meters downstream from the confluence of UNT 08188. Shrewsberry Township, York County Lat: 39° 45' 23.9626"N Long: 76° 43' 25.3678"W
2UNTSB	UNT 08187 to South Branch Codorus Creek, approximately 300 meters upstream from the confluence of South Branch Codorus Creek. Shrewsberry Township, York County Lat: 39° 46' 15.3757"N Long: 76° 43' 9.1824"W
1CR (Ref)	Carbaugh Run, just upstream of the confluence of Clear Run. Franklin Township, Adams County Lat: 39° 53' 53.52"N Long: 77° 27' 5.7594"W

Water Chemistry

No long-term water quality data were available from the UNTSB basin that would allow a direct comparison to water quality criteria. Discrete water quality samples collected April 25, 2008 at both candidate sites revealed good water quality (Table 2). No recent precipitation events had occurred to influence base flow prior to sample collection.

Table 2. UNT 08187 South Branch Codorus Creek Basin – Discrete Water Quality

FIELD PARAMETER	STATIONS[1]		REFERENCE[2]
	1UNTSB	2UNTSB	1CR
pH	7.33	7.22	5.66
Alkalinity (mg/L)	28	28	4
Specific Cond.(uS/cm)	133	109	20
Diss. O_2 (mg/L)	10.18	10.5	9.86

[1] Refer to Figure 1 and Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location

Aquatic Biota

The indigenous aquatic community is an excellent indicator of long-term water quality conditions and is used as a measure of water quality. DEP staff collected habitat and benthic macroinvertebrate data at both UNTSB locations and at one reference location on Carbaugh Run in Adams County on April 25, 2008 (Table 1, Figure 1).

Habitat. Instream habitat conditions were evaluated at each candidate station as well as the Carbaugh Run (1CR) reference station. The habitat evaluation consists of rating twelve habitat parameters to derive an overall station habitat score. The habitat scores for the two UNTSB stations were 219 and 217, reflecting optimal habitat conditions (Table 3).

Benthos. Benthic macroinvertebrate samples were collected at all three stations using the DEP's RBP benthic sampling methodology, which is a modification of EPA's Rapid Bioassessment Protocols (RBPs: Plafkin et al. 1989, Barbour et al. 1999). Taxonomic richness was good at both 1UNTSB and

2UNTSB with both stations dominated by pollution sensitive taxa (Hilsenhoff Biotic Index < 3) (Table 4).

Table 3. Habitat Assessment Results

PARAMETER	STATIONS[1]		REFERENCE[2]
	1UNTSB	2UNTSB	1CR
1. instream cover	19	18	20
2. epifaunal substrate	20	17	20
3. embeddedness	19	16	19
4. velocity/depth	15	18	15
5. channel alterations	20	20	20
6. sediment deposition	14	17	20
7. riffle frequency	19	19	19
8. channel flow status	15	20	20
9. bank condition	18	13	20
10. bank vegetative protection	20	19	20
11. grazing/disruptive pressures	20	20	20
12. riparian vegetation zone width	20	20	20
Total Score	219	217	233
Rating[3]	Optimal	Optimal	Optimal

[1] Refer to Figure 1 and Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Optimal ≥192

Table 4. UNT 08187 South Branch Codorus Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]		REFERENCE[2]
		1UNTSB	2UNTSB	1CR
EPHEMEROPTERA (MAYFLIES)				
Baetidae	*Acentrella*	27	36	1
	Acerpenna	2		
	Baetis	1		4
	Diphetor	3		
Ephemerellidae	*Drunella*	10	47	
	Ephemerella	43	39	19
	Eurylophella		1	
	Serratella			6
Heptageniidae	*Epeorus*	4		4
	Leucrocuta			7
	Maccaffertium	8	3	5
	Rhithrogena			2
Isonychidae	*Isonychia*	3	4	
Leptophlebiidae	*Paraleptophlebia*	15	2	22

[1] Refer to Figure 1 and Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location

Table 4 (cont.). UNT South Branch Codorus Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]		REFERENCE[2]
		1UNTSB	2UNTSB	1CR
PLECOPTERA (STONEFLIES)				
Leuctridae	*Leuctra*		7	8
Nemouridae	*Amphinemura*	4	26	3
Perlidae	*Acroneuria*	1	5	2
	Eccoptura	3		
Perlodidae	*Alloperla*			1
	Haploperla	1		
	Isoperla			3
	Sweltsa			8
TRICOPTERA (CADDISFLIES)				
Glossosomatidae	*Agapetus*	1	1	
Hydroptilidae	*Hydroptila*	1		
Hydropsychidae	*Ceratopsyche*		1	1
	Cheumatopsyche	3	3	1
	Diplectrona	4	8	5
	Hydropsyche		2	
Philopotamidae	*Dolophilodes*	10	8	1
Polycentropodidae	*Polycentropus*			2
Psychomyiidae	*Psychomyia*		1	
Rhyacophilidae	*Rhyacophila*		2	
Uenoidae	*Neophylax*		1	
DIPTERA (TRUE FLIES)				
Chironomidae		27	16	30
Empididae	*Chelifera*	1		
	Clinocera		2	
Simuliidae	*Simulium*			3
	Prosimulium			50
Tipulidae	*Antocha*	1	2	1
	Dicranota			1
	Hexatoma			1
MISC. INSECT TAXA				
Corydalidae	*Nigronia*			1
Elmidae	*Optioservus*	13	8	
	Oulimnius		1	
Psephenidae	*Psephenus*	1	1	
Ptilodactylidae	*Anchytarsus*	2		
Turbellaria			2	
Taxa Richness		**25**	**26**	**27**
Total # Organisms		**189**	**229**	**192**

[1] Refer to Figure 1 and Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location

BIOLOGICAL USE QUALIFICATIONS

The biological use qualifying criteria applied to UNTSB was the DEP's integrated benthic macroinvertebrate scoring test described at 25 Pa. Code §§ 93.4b(a)(2)(i)(A) and 93.4b(b)(1)(v). Selected benthic macroinvertebrate community metrics from the surveyed basin were compared to those from a reference stream with a comparable drainage area. Stations 1UNTSB and 2UNTSB were compared to Carbaugh Run (1CR). The Carbaugh Run station was used because it has a designated use of Exceptional Value (EV), it is a freestone stream and it has a comparable drainage area to the candidate stream. Sampling was conducted within a two-week period to minimize the effects of temporal variation. 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 these five metrics, both stations 1UNTSB and 2UNTSB had biological condition scores of 100% when compared to the reference station score. As a result, both stations exceeded the threshold of 92% required to qualify for an EV designation under the DEP's regulatory criterion (§ 93.4b(b)(1)(v)).

Table 5. UNT 08187 South Branch Codorus Creek Basin – RBP Metric Comparison

METRIC	STATIONS[1]		REFERENCE[2]
	1UNTSB	2UNTSB	1CR
TAXA RICHNESS	25	26	27
Cand/Ref (%)	93	96	
Biol. Cond. Score	8	8	8
MOD. EPT INDEX	14	16	16
Cand/Ref (%)	88	100	
Biol. Cond. Score	8	8	8
MOD. HBI	2.77	2.39	2.34
Cand-Ref	0.43	0.05	
Biol. Cond. Score	8	8	8
% DOMINANT TAXA	23	21	26
Cand-Ref	-3	-5	
Biol. Cond. Score	8	8	8
% MOD. MAYFLIES	58	58	34
Ref-Cand	-24	-24	
Biol. Cond. Score	8	8	8
TOTAL BIOLOGICAL CONDITION SCORE	40	40	40
% COMPARABILITY TO REFERENCE	**100**	**100**	

[1] Refer to Figure 1 and Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The DEP provided public notice of this 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, Shrewsbury Township was notified of the redesignation evaluation in a letter dated April 2, 2012. No comments or data were received as a result of the public notice.

Final Draft Notice, Comments and Response. Once the final draft report was completed it was made available to affected municipalities, County Planning Commissions, County Conservation Districts, the Department of Conservation and Natural Resources, the PFBC, and the Pennsylvania Game Commission in a letter dated February 24, 2017 with a public comment period ending 45-days later. The PFBC offered comments in support of the EV recommendation. No additional comments were received regarding the draft report.

RECOMMENDATION

Based on applicable regulatory definitions and requirements of § 93.4b, the DEP recommends that the Unnamed Tributary 08187 To South Branch Codorus Creek basin, from its source to mouth, be redesignated from the current WWF, MF to 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 adds approximately 5.01 stream miles of EV waters to Chapter 93.

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. United States Environmental Protection Agency; Office of Water. Washington, D.C.

Kaufmann, M., B. Chikotas. 1999. Unnamed Tributary (Shaeffer Hollow) to South Branch Codorus Creek Management Report. Pennsylvania Fish and Boat Commission.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, R.M. Hughes. 1989. Rapid Bioassessment Protocols for use in streams and rivers: Benthic Macroinvertebrates and Fish. EPA/444/4-89-001. United States Environmental Protection Agency; Office of Water. Washington, D.C.