

**UNNAMED TRIBUTARY TO BIG COVE CREEK**  
**FULTON COUNTY**

**WATER QUALITY STANDARDS REVIEW**  
**DRAFT STREAM EVALUATION REPORT**

**Segment: Basin**  
**Stream Code: 60532**  
**Drainage List: Z**

**WATER QUALITY MONITORING SECTION**  
**WATER QUALITY DIVISION**  
**BUREAU OF CLEAN WATER**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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DRAFT

## **INTRODUCTION**

The Department of Environmental Protection (DEP) conducted an evaluation of the Unnamed Tributary (UNT) to Big Cove Creek basin in Fulton County in response to an existing use evaluation request by the DEP South Central Regional Office. The entire UNT to Big Cove Creek basin is currently designated Cold Water Fishes, Migratory Fishes (CWF, MF).

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. Existing uses are protected 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 Environmental Quality Board (EQB).

## **GENERAL WATERSHED DESCRIPTION**

The UNT to Big Cove Creek is a first order, high gradient tributary to Big Cove Creek within the Potomac River basin and is located within Ayres Township, Fulton County. The UNT to Big Cove Creek has a drainage area of approximately 0.8 square miles and consists of 1.63 stream miles. According to the National Land Cover Database (NLCD) 2019, the basin consists of 90% forested, 9.1% planted/cultivated, 0.6% developed lands and 0.3% other land cover (Dewitz 2021). There is one National Pollutant Discharge Elimination System (NPDES) discharge located within the UNT to Big Cove Creek basin.

## **WATER QUALITY**

### **Discrete Physiochemical**

DEP staff collected in-situ field meter data and water chemistry data in March 2022 from the UNT to Big Cove Creek station and the Jones Mill Run reference station (Figure 1, Table 1). Physicochemical data for the UNT to Big Cove Creek is indicative of excellent water quality conditions (Table 2).

**Table 1.** Station Locations – UNT to Big Cove Creek and Reference (REF).

<b>STATION</b>	<b>DESCRIPTION</b>
<b>UNTBCC</b>	UNT 60532 to Big Cove Creek 500 meters upstream of mouth Ayres Township, Fulton County Lat: 39.85504                      Long: -78.05171
<b>JMR (REF)</b>	Jones Mill Run Jefferson and Middlecreek Townships, Somerset County Lat: 40.00398                      Long: -79.24178

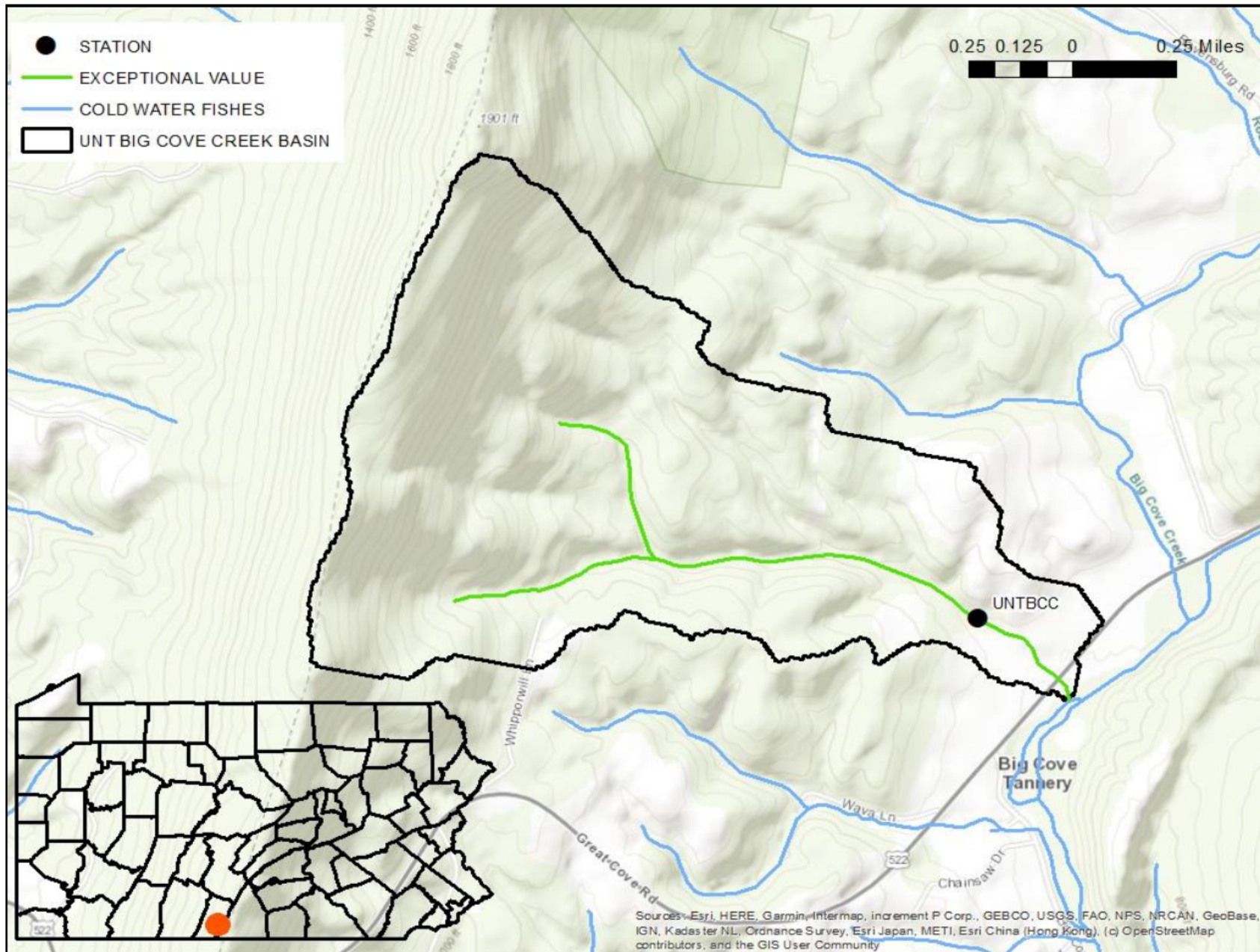


Figure 1. UNT Big Cove Creek Station Location and Redesignation Recommendation.

**Table 2.** Discrete Physiochemical Data.

	PARAMETERS	UNITS	STATION <sup>1</sup>	
			UNTBCC	JMR
METALS AND IONS	ALUMINUM D	ug/L	<15.0	19.600
	ALUMINUM T	ug/L	39.600	43.200
	BARIUM T	ug/L	32.00	38.300
	BORON T	ug/L	<200.0	<200.0
	BROMIDE	ug/L	<25.0	<25.0
	CADMIUM D	ug/L	<0.200	<0.200
	CALCIUM T	mg/L	2.530	9.510
	CHLORIDE T	mg/L	1.50	-
	COPPER D	ug/L	<4.00	<4.00
	COPPER T	ug/L	<4.00	<4.00
	IRON D	ug/L	<100.0	<100.0
	IRON T	ug/L	<100.0	<100.0
	LEAD D	ug/L	<1.0	<1.00
	LEAD T	ug/L	<1.0	<1.00
	LITHIUM D	ug/L	<25.0	<25.0
	LITHIUM T	ug/L	<25.0	<25.0
	MAGNESIUM T	mg/L	1.49	1.20
	MANGANESE D	ug/L	<10.0	3.340
	MANGANESE T	ug/L	<10.0	7.60
	NICKEL D	ug/L	<50.0	<8.0
	NICKEL T	ug/L	<50.0	<8.0
	POTASSIUM T	mg/L	<1.00	<1.00
	SELENIUM D	ug/L	<4.00	<4.00
	SELENIUM T	ug/L	<4.00	<4.00
	SODIUM T	mg/L	1.56	8.89
	STRONTIUM T	ug/L	13.00	20.00
	SULFATE T	mg/L	6.60	6.44
	ZINC D	ug/L	<30.0	6.380
ZINC T	ug/L	<30.0	6.320	
NUTRIENTS	AMMONIA D	mg/L	<.02	0.0430
	AMMONIA T	mg/L	<.02	0.04
	NITRATE & NITROGEN D	mg/L	0.52	0.77
	NITRATE & NITROGEN T	mg/L	0.52	0.76
	NITROGEN D	mg/L	0.559	-
	NITROGEN T	mg/L	0.52	0.80
	ORTHO PHOSPHORUS D	mg/L	<.01	<.01
	ORTHO PHOSPHORUS T	mg/L	<0.01	<0.01
	PHOSPHORUS D	mg/L	<0.01	<0.01
PHOSPHORUS T	mg/L	<.01	<.01	
PHYSICAL / OTHER	ALKALINITY	mg/L	7.4	13.4
	DISSOLVED OXYGEN	mg/L	12.78	11.27
	HARDNESS	mg/L	12	29
	TEMPERATURE	°C	2.7	6.9
	OSMOTIC PRESSURE	mosm/kg	<1	1
	pH	pH units	6.4	7.39
	SPECIFIC COND	µS/cm <sup>c</sup>	39.40	113.00
	TDS	mg/L	<20	34
	TOC	mg/L	1.10	0.56
	TSS	mg/L	<20	<20

<sup>1</sup> Refer to Figure 1 and/or Table 1 for station locations  
 "<" indicate concentrations below the reporting limit.  
 "-\*" indicate tests not reported

### Biological

The indigenous aquatic community is an excellent indicator of long-term conditions and is used as a measure of water quality. DEP staff collected macroinvertebrate data from one station on the UNT to Big Cove Creek and from one reference station on Jones Mill Run in Somerset County. Data was collected using the DEP benthic macroinvertebrate data collection protocols, which is a modification of

the U.S. Environmental Protection Agency's (EPA) Rapid Bioassessment Protocols (Plafkin et al. 1989, Barbour et al. 1999). Data collected from both the UNT to Big Cove Creek and Jones Mill Run were collected using DEP's *Wadeable Riffle-Run Stream Macroinvertebrate Data Collection Protocol* (Shull 2017).

Macroinvertebrate data collected from the UNT to Big Cove Creek is consistent with excellent water quality conditions (Table 3). The UNT to Big Cove Creek had a total taxa richness of 27 with an Ephemeroptera Plecoptera and Trichoptera (EPT) richness of 16. While Ephemeroptera richness was lower compared to the Jones Mill Run reference (3 vs. 7), Plecoptera richness was higher (8 vs. 5) and Trichoptera richness was the same (5). The lower Ephemeroptera richness at the UNT to Big Cove Creek station is also consistent with the lower % modified mayfly metric (8.8%) compared to Jones Mill Run (40.1%). Although the mayfly (Ephemeroptera) community is not quite as robust as the reference station, other metrics including Hilsenhoff Biotic Index (HBI; 2.35) are indicative of a very healthy macroinvertebrate community (Tables 3 & 5).

**Table 3.** Benthic Macroinvertebrate Data.

TAXA		STATION <sup>1</sup>	REF <sup>1</sup>
		UNTBCC	JMR
Ephemeroptera (Mayflies)			
Baetidae	<i>Baetis</i>	-	2
	<i>Dipheter</i>	1	1
	<i>Plauditus</i>	-	6
Ephemerellidae	<i>Ephemerella</i>	-	31
Heptegeniidae	<i>Epeorus</i>	-	26
	<i>Maccaffertium</i>	3	3
Leptophlebiidae	<i>Paraleptophlebia</i>	18	13
Plecoptera (Stoneflies)			
Capniidae	<i>Allocapnia</i>	5	2
	<i>Paracapnia</i>	47	1
Chloroperlidae	<i>Alloperla</i>	2	1
	<i>Sweltsa</i>	5	-
Leutridae	<i>Leuctra</i>	3	-
Perlidae	<i>Acroneuria</i>	14	-
	<i>Eccopectura</i>	17	-
Perlodidae	<i>Isoperla</i>	2	6
Taeniopteryx	<i>Taeniopteryx</i>	-	2
Trichoptera (Caddisflies)			
Hydropsychidae	<i>Cheumatopsyche</i>	3	-
	<i>Diplectrona</i>	20	12
	<i>Hydropsyche</i>	-	2
Limnephilidae	<i>Pycnopsyche</i>	4	-
Polycentropidae	<i>Dolophilodes</i>	6	3
Psychomyiidae	<i>Lype</i>	-	3
Rhyacophilidae	<i>Rhyacophila</i>	3	14
Uenoidae	<i>Neophylax</i>	-	14
Megaloptera (Dobsonflies/Alderflies)			
Corydalidae	<i>Nigronia</i>	2	-
Odonata (Dragon / Damselflies)			
Aeshnidae	<i>Boyeria</i>	1	-
Gomphidae	<i>Lanthus</i>	1	-

**Table 3 (cont.).** Benthic Macroinvertebrate Data.

TAXA		STATION <sup>1</sup>	REF <sup>1</sup>
		UNTBCC	JMR
Diptera (True Flies)			
Ceratopogonidae	<i>Probezzia</i>	-	2
Chironomidae		36	22
Tipulidae	<i>Antocha</i>	-	1
	<i>Dicranota</i>	31	-
	<i>Hexatoma</i>	2	3
	<i>Limnophila</i>	-	2
	<i>Tipula</i>	5	-
Coleoptera (Aquatic Beetles)			
Elmidae	<i>Optioservus</i>	-	1
	<i>Oulimnius</i>	-	21
	<i>Stenelmis</i>	3	-
Psephenidae	<i>Ectopria</i>	-	3
	<i>Psephenus</i>	1	-
Non-Insect Taxa			
Oligochaeta		2	-
Cambaridae	<i>Cambarus</i>	1	-
Taxa Richness		27	26
Total Organisms		238	197

<sup>1</sup> Refer to Figure 1 and/or Table 1 for station locations

"-" indicate taxa was not identified at a particular station

### Physical

Instream habitat was evaluated at each station where benthic macroinvertebrates were collected (Table 4). The habitat evaluation consists of rating twelve parameters to derive a station habitat score. The total habitat score for the UNT to Big Cove Creek fell within the suboptimal range (132-192) and the total habitat score at the reference station (198) was above the optimal threshold (192). Both candidate and reference stations had fairly low embeddedness and sediment deposition scores, which indicates at least moderate siltation effects.

**Table 4.** Habitat Evaluation Data.

PARAMETERS	STATION <sup>1</sup>	REF <sup>1</sup>
	UNT BCC	JMR
1. INSTREAM COVER	15	18
2. EPIFAUNAL SUBSTRATE	13	19
3. EMBEDDEDNESS	10	11
4. VELOCITY/DEPTH	9	17
5. CHANNEL ALTERATIONS	20	19
6. SEDIMENT DEPOSITION	13	10
7. RIFFLE FREQUENCY	10	19
8. CHANNEL FLOW STATUS	9	20
9. BANK CONDITION	12	13
10. BANK VEGETATIVE PROTECTION	19	17
11. GRAZING/DISRUPTIVE PRESSURES	19	17
12. RIPARIAN VEG. ZONE WIDTH	16	18
Total Score	165	198
Rating <sup>2</sup>	SUB	OPT

<sup>1</sup> Refer to Figure 1 and/or Table 1 for station locations

<sup>2</sup> OPT = Optimal ( $\geq 192$ ), SUB = Suboptimal (132-192)

### **INTEGRATED BENTHIC MACROINVERTEBRATE SCORING TEST**

The DEP applied its integrated benthic macroinvertebrate scoring test described at 25 Pa. Code § 93.4b(a)(2)(i)(A) to the UNT to Big Cove Creek. Selected benthic macroinvertebrate community metrics from the UNT Big Cove Creek station were compared to the reference station from Jones Mill Run. Jones Mill Run was used as a reference because it has demonstrated an existing use of Exceptional Value (EV) based on biological measures and the macroinvertebrate community has demonstrated best attainable biological communities by scoring well above the top 25<sup>th</sup> percentile of Pennsylvania EV reference streams. In addition, the Jones Mill Run reference station has optimal habitat and similar gradient, drainage area, pH and alkalinity to the candidate stream station (DEP 2013). 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 (HBI), percent dominant taxon, and percent modified mayflies (Table 5).

Based on these five metrics, the candidate station on from the UNT to Big Cove Creek exceeded the HQ qualifying criterion of 83% (Table 5).



**Table 5.** Benthic Macroinvertebrate Metric Comparison.

METRIC	STATION <sup>1</sup>	REF <sup>1</sup>
	UNTBCC	JMR
1. TAXA RICHNESS	27	26
Cand/Ref (%)	104	-
Biol. Cond. Score	8	8
2. MOD. EPT INDEX	14	15
Cand/Ref (%)	93	-
Biol. Cond. Score	8	8
3. MOD. HBI	2.35	2.40
Cand-Ref	-0.05	-
Biol. Cond. Score	8	8
4. % DOMINANT TAXA	19.7	15.7
Cand-Ref	4	-
Biol. Cond. Score	8	8
5. % MOD. MAYFLIES	8.8	40.1
Ref-Cand	31.3	-
Biol. Cond. Score	3	8
TOTAL BIOLOGICAL CONDITION SCORE	35	40
% COMPARABILITY TO REFERENCE	88	

<sup>1</sup> Refer to Table 1 and/or Figure 1 for station locations

## **PUBLIC NOTICE AND REQUEST FOR TECHNICAL DATA**

The DEP provided public notice of this redesignation evaluation and requested any technical data from the general public through publication in the *Pennsylvania Bulletin* on October 29, 2022 (52 Pa.B. 6785) and on the DEP website on October 28, 2022. Fulton County, Ayr Township, and Fulton County Conservation District were notified of the redesignation evaluation in an emailed letter dated October 28, 2022. In addition, notifications were distributed through the DEP eNotice. In response to the notices, the DEP received a letter of support from the Theodore Roosevelt Conservation Partnership.

## **RECOMMENDATION**

Based on applicable regulatory definitions in 25 Pa. Code § 93.4b(a)(2)(i)(A) (the DEP's integrated benthic macroinvertebrate scoring test), the DEP recommends that the UNT to Big Cove Creek basin be redesignated to High Quality – Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) based on a score greater than 83% when compared to a reference station.

This recommendation adds **1.63** miles of High Quality stream miles to Chapter 93.

## **LITERATURE CITED**

- Barbour, M. T., Gerritsen, J., Snyder, B. D., Stribling, J. B. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish. Second Edition. United States Environmental Protection Agency. EPA 841-B-99-002.
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<http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7842&DocName=WATER%20QUALITY%20ANTIDEGRADATION%20IMPLEMENTATION%20GUIDANCE.PDF%20>
- Dewitz, J., and U.S. Geological Survey, 2021, National Land Cover Database (NLCD) 2019 Products (ver. 2.0, June 2021): U.S. Geological Survey data release, <https://doi.org/10.5066/P9KZCM54>
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- Shull, D. R. (editor). 2017. Wadeable riffle-run stream macroinvertebrate data collection protocol. Chapter 3.1, pages 2–8 in M. J. Lookenbill, and R. Whiteash (editors). Water quality monitoring protocols for streams and rivers. Pennsylvania Department of Environmental Protection, Harrisburg, Pennsylvania.