

**FISHING CREEK
LANCASTER COUNTY**

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

SEGMENT: BASIN

STREAM CODE: 07253

DRAINAGE LIST: O

**WATER QUALITY MONITORING SECTION (DSB)
DIVISION OF WATER QUALITY STANDARDS
BUREAU OF WATER STANDARDS AND FACILITY REGULATION
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

MAY 2010

INTRODUCTION

Fishing Creek has a designated use of High Quality-Cold Water Fishes, Migratory Fishes (HQ-CWF, MF) in Chapter 93 of the Pennsylvania Code. As a result of a petition submitted by Mr. Patrick McClure and accepted by the Environmental Quality Board (EQB) for further study on January 18, 2005, this basin was evaluated for redesignation as Exceptional Value, Migratory Fishes (EV, MF). This report is based on a field survey conducted by the Department in April of 2005.

GENERAL WATERSHED DESCRIPTION

Fishing Creek is a tributary to the Susquehanna River (Figure 1). This basin covers an area of 14.2 square miles and contains 29.0 stream miles. It is located in Drumore and Providence Townships, Lancaster County. Land use in this basin is mostly forested slopes with some low-density residential housing along the paved roads in the lower 2/3 of the basin. The upper 1/3 is mostly agriculture in the form of crops and cow pastures but forested woodlots and low-density residential housing are also present. As a result, this area is less shaded and shows more evidence of erosion than the rest of the stream. Fishing Creek basin ranges in elevation from 900 feet in the north at the source to 200 feet at the mouth. This is a freestone stream with a moderate gradient throughout its length. Three stations were sampled as part of this survey (Figure 1 and Table 1).

WATER QUALITY AND USES

Surface Water:

No long-term water quality data were available to allow a direct comparison to water quality criteria. A report by the Pennsylvania Fish and Boat Commission (PFBC), based on an August 1993 survey, indicated that the water quality of Fishing Creek was generally good (Table 2). Since the instantaneous nature of grab samples precludes comparison to applicable water quality criteria, the indigenous aquatic community is a better indicator of long-term conditions and is used as a measure of ecological significance.

There are no surface water withdrawals for public water supply in this basin. The Buck Company Foundry has an NPDES permit (PAS203501) for several stormwater discharges into an UNT Fishing Creek in Providence Township.

The agricultural areas in the upper portion of the basin have the potential for nonpoint source pollution. That potential is greatly reduced in the lower portion of the basin because of wide forested buffer zones along the stream.

Aquatic Biota:

Habitat assessments and biological samplings were conducted at 4 stations (3 candidate and 1 reference) during the April 2005 survey. The physical habitat assessments revealed that conditions at Station 1FC, 2FC, 3FC and Reference Station R1 scored in the Optimal range for

benthic macroinvertebrates and fish (Table 3). Overall, habitat scores for the Fishing Creek stations ranged from 189 to 201 out of a possible 240.

Benthic macroinvertebrate samples were collected using the Department's Antidegradation protocol (adapted from Plafkin's 1989 and Barbour's 1999 Rapid Bioassessment Protocols manuals). Taxonomic diversity was high at all stations with a mixture of individuals from taxa that are sensitive to water quality degradation (e.g. *Ephemerella*, *Haploperla*, and *Diplectrona*) and taxa that are more tolerant of such pollution (e.g. *Baetis*, *Hydropsyche*, *Stenelmis*, and Chironomidae). The numbers of tolerant individuals outnumbered the intolerant ones at all stations. Stations 1FC and 3FC had numbers of Chironomidae that made up 30% and 37% of the subsample respectively. This along with the numbers of the other tolerant taxa listed above would indicate that this stream may be receiving a significant amount of nutrient enrichment probably from the agriculture in the upper portion of the basin.

The Pennsylvania Fish and Boat Commission (PFBC) surveyed the candidate stream in August 1993. They found 11 fish species in the sampled reach located near Station 2FC and 21 fish species at Station 3FC, located 250 meters upstream from the mouth (Table 4). They also found a small population of wild brown trout throughout the basin but concluded that poor instream habitat and summer water temperatures limited trout numbers. Rosyside Dace, a minnow with a very restricted range in Pennsylvania, was abundant throughout the basin except near the mouth.

A fish species that was abundant at Station 3FC was the Chesapeake Logperch (*Percina bimaculata*). These darters are part of a disjunct population of the Logperch (*Percina caprodes*) that was historically considered a subspecies (*Percina caprodes semifasciata*). Recent work by Near (2008) and Near and Benard (2004) has shown that this population deserves to be elevated from a subspecies to a true species. The current known range of the Chesapeake Logperch is the lower reaches of the Susquehanna River from Holtwood Dam in PA to the Chesapeake Bay in MD along with the lower reaches of 8 Susquehanna River tributaries, 5 in MD and 3 in PA. Since the evidence that shows this population deserves species status is so recent, the PFBC and the Fishes Technical Committee (FTC) of the PA Biological Survey (PABS) have not had time to review the status of this species for inclusion on PA's List of Threatened and Endangered Species. Since the population of Chesapeake Logperch in Fishing Creek represents a significant portion of the total global population of this species the Department concludes that this stream qualifies as a surface water of exceptional ecological significance based on § 93.4b(b)(2).

BIOLOGICAL USE QUALIFICATIONS

The biological use qualifying criteria applied to Fishing Creek was the integrated benthic macroinvertebrate score test described at § 93.4b(a)(2)(i)(A) and § 93.4b(b)(1)(v). This score is calculated from the macroinvertebrate samples referenced above. Following the Department's Antidegradation protocol, a 200 (+/- 20%) count subsample was randomly selected from each total sample and enumerated (Table 5). Selected benthic macroinvertebrate community metrics were generated from these subsamples. Candidate station metrics were compared to Rock Run (01591), a reference stream with a comparable drainage area (Table 6). This reference stream has a protected use designation of EV and is a tributary to French Creek (01548) located in

Chester County. All sampling was conducted on the same day to minimize the effects of seasonal variation. This comparison was done using the following metrics, which were selected as being indicative of community health: taxa richness; modified EPT index (total number of intolerant Ephemeroptera, Plecoptera, and Trichoptera taxa); modified Hilsenhoff Biotic Index; percent dominant taxon; and percent modified mayflies.

Based on these five metrics, Stations 1FC, 2FC, and 3FC had biological condition scores of 60%, 85%, and 60% respectively of the reference station score. None of these scores met the threshold of 92% that would qualify them for an EV designation under the Department's regulatory criterion (§ 93.4b(b)(1)(v)).

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this redesignation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on February 26, 2005 (35 Pa.B 1477). A similar notice was also published in the Intelligencer Journal on February 18, 2005. In addition, Drumore and Providence Townships along with the Lancaster County Planning Commission were all notified of the evaluation in a letter dated February 7, 2005. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notifications. In 2005, RETTEW Associates, Inc. collected benthic macroinvertebrates and did a fish species survey that was funded in part by a Growing Greener grant to the Lancaster Conservancy. No data from this survey were submitted to DEP during the public comment period.

The petitioner and local municipality and planning commission representatives were notified by a postcard mailing that the report was available on the Department's web page for review with a 30-day comment period, which closed on April 16, 2010. In response, the Lancaster County Conservancy expressed support of the below recommendations and requested review and reconsideration of the stream segments not being proposed for EV redesignation at a future date.

RECOMMENDATIONS

Based on applicable regulatory definitions and requirements of § 93.4b, the Department recommends that the protected use designation of Fishing Creek basin (07253) from the source to UNT 07256 (near T434 bridge) retain the current HQ-CWF, MF designation, and the Fishing Creek basin from and including UNT 07256 to the mouth be upgraded to EV, MF based on § 93.4b(b)(2), surface waters of exceptional ecological significance. This EV designation affects 7.27 stream miles.

REFERENCES

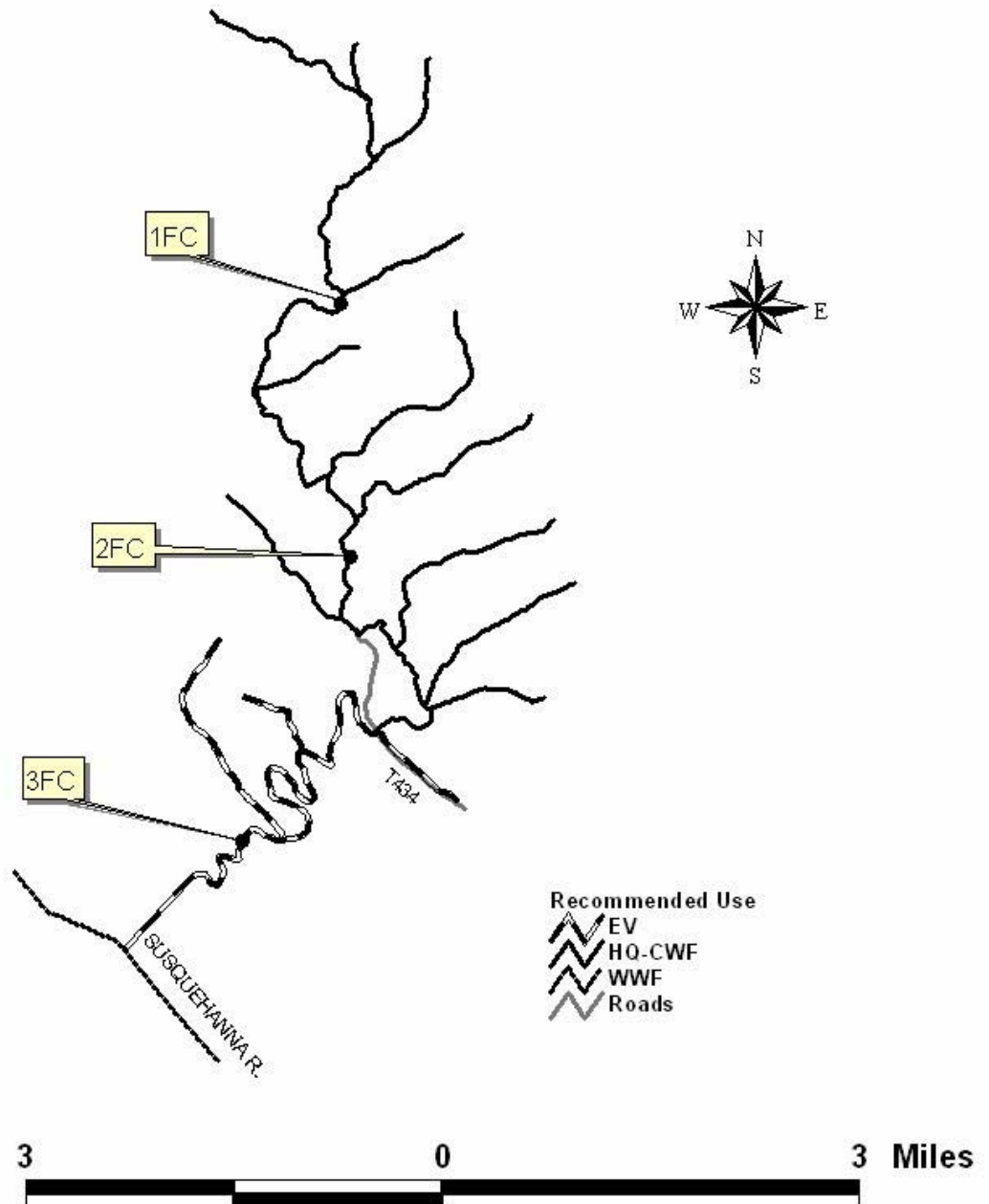
Barbour, MT, J. Gerritsen, BT Snyder, and JB Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition. United States Environmental Protection Agency. EPA/841/B-99-002.

Near, TJ. 2008. Rescued from Synonymy: A Redescription of *Percina bimaclata* Haldeman and a Molecular Phylogenetic Analysis of Logperch Darters. Bulletin of the Peabody Museum of Natural History 49(1): 3-18.

Near, TJ and MF Benard. 2004. Rapid Allopatric Speciation in Logperch Darters (Percidae: *Percina*). Evolution 58(12): 2798-2808.

Plafkin, JL, MT Barbour, KD Porter, SK Gross, & RM Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. United States Environmental Protection Agency. EPA/444/4-89-001

FIGURE 1
STATION LOCATIONS
FISHING CREEK



**TABLE 1
STATION LOCATIONS
FISHING CREEK
LANCASTER COUNTY**

<u>STATION</u>	<u>LOCATION</u>
1FC	Fishing Creek (07253) approximately 20 meters downstream from the T450 Bridge. Drumore Township, Lancaster County. Lat: 39 51 04 Long: 76 14 40 RM: 9.09
2FC	Fishing Creek approximately 100 meters upstream from the SR3006 Bridge. Drumore Township, Lancaster County. Lat: 39 49 28 Long: 76 14 38 RM: 6.14
3FC	Fishing Creek approximately 300 meters upstream from the SR3004 Bridge. Drumore Township, Lancaster County. Lat: 39 47 40 Long: 76 15 34 RM: 0.75
R1	Rock Run (01591); approximately 30 meters upstream of the crossing of old SR0023 South Coventry Township, Chester County. Lat: 40 10 27 Long: 75 41 46 RM: 0.24

**TABLE 2
WATER CHEMISTRY¹
FISHING CREEK
LANCASTER COUNTY**

STATION	2FC	3FC
Temp (°C)	22	21
Cond (µmhos)	138	160
Diss. O ₂ (mg/l)	8.3	9.0
pH	7.0	7.3
Total Hardness (mg/l)	55	61
Total Alkalinity (mg/l)	20	21

¹ - Data collected by PFBC (August 1993)

**TABLE 3
HABITAT ASSESSMENT SUMMARY
FISHING CREEK
LANCASTER COUNTY
APRIL 21, 2005**

HABITAT PARAMETER	STATIONS¹			
	1FC	2FC	3FC	R1
1. instream cover	15	17	16	18
2. epifaunal substrate	17	18	15	19
3. embeddedness	14	16	13	17
4. velocity/depth	17	14	17	14
5. channel alterations	16	16	15	16
6. sediment deposition	16	17	15	18
7. riffle frequency	17	18	16	18
8. channel flow status	16	16	16	16
9. bank condition	15	16	17	15
10. bank vegetation protection	14	17	17	14
11. grazing/disruptive pressures	17	18	18	14
12. riparian vegetation zone width	17	18	14	12
Total Score	191	201	189	191
Rating ²	OPT	OPT	OPT	OPT

¹ Refer to Figure 1 and Table 1 for station locations.

² OPT = Optimal (≥ 192);
SUB =Suboptimal (132-180)

**TABLE 4
FISHES
FISHING CREEK
LANCASTER COUNTY**

SPECIES NAME	STATION	
	2FC	3FC
Gizzard shad, <i>Dorosoma cepedianum</i>		A
Rainbow trout, <i>Oncorhynchus mykiss</i>	R	
Brown trout, <i>Salmo trutta</i>	P	P
Rosyside Dace, <i>Clinostomus funduloides</i>	A	
Cutlips minnow, <i>Exoglossum maxillingua</i>	P	P
Satinfin shiner, <i>Cyprinella analostana</i>		A
Spotfin shiner, <i>Cyprinella spiloptera</i>		A
Common shiner, <i>Luxilus cornutus</i>		A
Spottail shiner, <i>Notropis hudsonius</i>		A
Bluntnose minnow, <i>Pimephales notatus</i>		A
Blacknose dace, <i>Rhinichthys atratulus</i>	C	P
Longnose dace, <i>Rhinichthys cataractae</i>	C	P
Creek chub, <i>Semotilus atromaculatus</i>	A	
Common carp, <i>Cyprinus carpio</i>		P
White sucker, <i>Catostomus commersoni</i>	P	A
Northern hog sucker, <i>Hypentelium nigricans</i>	P	P
Yellow bullhead, <i>Ameiurus natalis</i>		P
Margined madtom, <i>Noturus insignis</i>	C	P
Green sunfish, <i>Lepomis cyanellus</i>		P
Rock bass, <i>Ambloplites rupestris</i>		R
Smallmouth bass, <i>Micropterus dolomieu</i>		P
Largemouth bass, <i>Micropterus salmoides</i>		P
Tessellated darter, <i>Etheostoma olmstedii</i>	R	C
Chesapeake Logperch, <i>Percina bimaculata</i>		A

1 - Data collected by the PFBC (August 1993)
A = Abundant; C = Common; P = Present; R = Rare

TABLE 5
SEMI-QUANTITATIVE MACROINVERTEBRATE DATA
FISHING CREEK, LANCASTER COUNTY
APRIL 21, 2005

TAXA	STATIONS			
	1FC	2FC	3FC	R1
Ephemeroptera (mayflies)				
Baetidae; <i>Acentrella</i>		2	2	10
<i>Baetis</i>	15	11	28	11
Ephemerellidae; <i>Drunella</i>				24
<i>Ephemerella</i>	22	46	12	79
<i>Serratella</i>	1			
Heptageniidae; <i>Cinygmula</i>			1	
<i>Epeorus</i>	2	4	4	15
<i>Leucrocuta</i>	1			
<i>Rhithrogena</i>		2		
<i>Stenacron</i>	1			
<i>Stenonema</i>	4	3	2	7
Isonychiidae; <i>Isonychia</i>	1			
Leptophlebiidae; <i>Paraleptophlebia</i>				1
Plecoptera (stoneflies)				
Chloroperlidae; <i>Haploperla</i>	16		4	
<i>Sweltsa</i>	1		3	
Leuctridae; <i>Leuctra</i>	2	3		1
Nemouridae; <i>Amphinemura</i>	2		3	7
Perlidae; <i>Acroneuria</i>	2	9	4	1
<i>Paragnetina</i>			2	
Perlodidae; <i>Isoperla</i>	3	4	1	2
Tricoptera (caddisflies)				
Hydropsychidae; <i>Cheumatopsyche</i>	7	1	10	2
<i>Diplectrona</i>	14	27	4	4
<i>Hydropsyche</i>	22	20	22	13
Philopotamidae; <i>Dolophilodes</i>	3	2	5	
Rhyacophilidae; <i>Rhyacophila</i>		2	2	6
Diptera (true flies)				
Blephariceridae; <i>Blepharicera</i>				1
Ceratopogonidae			1	
Empididae; <i>Chelifera</i>				1
<i>Clinocera</i>	1	1	1	
<i>Hemerodromia</i>			1	
Simuliidae; <i>Prosimulium</i>		2		
<i>Simulium</i>		2	2	1
Tipulidae; <i>Antocha</i>	7	2	4	6
<i>Hexatoma</i>			1	
<i>Tipula</i>	1			
Chironomidae	66	40	86	10

TABLE 5 (continued)

TAXA	STATIONS			
	1FC	2FC	3FC	R1
Megaloptera (dobson-, fishflies)				
Corydalidae; <i>Nigronia</i>	1	3	4	
Odonata (dragon-, damselflies)				
Gomphidae; <i>Stylogomphus</i>		1	1	2
Coleoptera (aquatic beetles)				
Elmidae; <i>Optioservus</i>	5			2
<i>Stenelmis</i>	15	1	13	
Psephenidae; <i>Psephenus</i>	3	1	3	4
Ptilodactylidae; <i>Anchytarsus</i>		1		
Non-Insect Taxa				
Oligochaeta	1		2	2
Amphipoda (scuds)				
Gammaridae; <i>Gammarus</i>	3		1	
Decapoda (crayfish)				
Cambaridae				
Cambaridae; <i>Cambarus</i>	1	1	1	
Total number of individuals	223	191	230	212

TABLE 6
RBP METRIC COMPARISON
FISHING CREEK
LANCASTER COUNTY

METRIC	STATIONS			
	1FC	2FC	3FC	R1
1. TAXA RICHNESS	29	25	31	24
Cand/Ref (%)	121	104	129	xxx
Biol. Cond. Score	8	8	8	8
2. MOD. EPT INDEX	15	11	14	12
Cand/Ref (%)	125	92	117	xxx
Biol. Cond. Score	8	8	8	8
3. MOD. HBI	3.86	2.84	4.60	2.27
Cand-Ref	1.59	0.57	2.33	xxx
Biol. Cond. Score	0	8	0	8
4. % DOMINANT TAXA	30	24	37	37
Cand-Ref	-7	-13	0	xxx
Biol. Cond. Score	8	8	8	8
5. % MOD. MAYFLIES	14	30	9	64
Ref-Cand	50	34	55	xxx
Biol. Cond. Score	0	2	0	8
TOTAL BIOLOGICAL CONDITION SCORE	24	34	24	40
% COMPARABILITY TO REFERENCE	60	85	60	