

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

**BEAVER CREEK  
CHESTER COUNTY**

**Segment: Basin**

**Drainage List: G**

**Stream Code: 00297**

WATER QUALITY ASSESSMENT SECTION (GLW)  
DIVISION OF WATER QUALITY STANDARDS  
BUREAU OF WATER STANDARDS AND FACILITY REGULATION  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OCTOBER 2006

## **INTRODUCTION:**

Beaver Creek, a freestone stream, is a tributary to the East Branch Brandywine Creek in East and West Brandywine and Caln Townships of Chester County. The current land use in the watershed consists mostly of agriculture (45%) and forest (41%), along with some single-family residential development (10.9%). There are 10 discharge permits for stormwater (3), single residence sewage treatment (2), non-publicly owned sewage treatment (4), drinking water treatment (1) and one surface water withdrawal (irrigation) permit for the basin. The designated use of the upper Beaver Creek basin (upstream of the East Brandywine/Caln Township border) is not defined in Chapter 93, whereas downstream of the referenced border, the designated use is Trout Stocking, Migratory Fishes (TSF, MF).

In order to correct this omission, DEP and Pennsylvania Fish & Boat Commission (PFBC) staff conducted numerous field surveys between May 2000 and July 2001. In addition, PFBC staff had previously conducted an electrofishing survey in August 1994. The United States Geological Survey (USGS) also collected water temperature data between July 1998 and September 1999. This evaluation is based on field surveys conducted on May 24, June 26, July 14, 2000, and July 10, 2001 and data from the earlier PFBC and USGS surveys.

## **FINDINGS:**

A total of 5 sites were surveyed between May 2000 and July 2001. Southeast Regional Office (SERO) and Central Office (CO) DEP staff, along with PFBC staff, surveyed two upper sites, at Hadfield Road (1BC) and Osborne Road (2BC) (Figure 1, Table 1) on May 24, 2000. On June 26, 2000 two more sites were added downstream, one near Meadow Drive (3BC) and one downstream of Lloyd Avenue in Downingtown (4BC) (Figure 1, Table 1). On July 14, 2000 SERO and PFBC staff returned to Beaver Creek and resampled sites 1BC and 3BC. On July 10, 2001 SERO and CO staff added a station at Manor Avenue in Downingtown (5BC) and resurveyed 4BC (Figure 1, Table 1).

During the May 2000 survey, five wild brown trout, one wild brook trout, and a stocked brook trout were collected upstream from 2BC (Table 2). A total of 13 wild brown trout were collected below the East Brandywine and Caln Township border at stations 2BC, 3BC, 4BC and 5BC during May, June, July 2000 and July 2001 surveys. During PFBC's 1994 survey, brown trout were also found further upstream from 2BC near the village of Bondsville, above the East Brandywine and Caln Township border and downstream from an impoundment at SR 4015 (Bondsville Road). Further upstream, at 1BC nine fish species including blacknose dace, creek chub, and white sucker were collected (Table 2), but no trout, during the May and July 2000 surveys. Since this station is located above the impoundment at Bondsville Road, this on-stream impoundment probably excludes trout from this segment.

American eel were found at all 5 sample stations and on every survey date during the 2000 and 2001 surveys (Table 2). Despite the impoundment at Bondsville Road, American eel was found at 1BC, indicating the impoundment is not a barrier to upstream migration of this species.

Temperature data was collected periodically by USGS from July 1998 to September 1999 at 4BC (Table 3). Temperature data was also collected during DEP and PFBC surveys in 1994, 2000 and 2001 at some sites (Table 3). Instream temperatures for each of the survey periods varied from the low 60's (°F) to the mid 70's (°F). The temperature regime at 4BC, as documented by USGS in 1999, frequently exceeded Chapter 93 temperature criteria for CWF (Table 3). Though these temperature regimes provide marginal conditions for reproducing trout populations, it has not prevented the establishment of a modest reproducing brown trout population in the lower reaches of the basin.

### **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 April 22, 2000 (30 Pa.B 2071). A similar notice was also published in the Daily Local News (West Chester) on April 21, 2000. In addition, East Brandywine Township was notified of the evaluation in a letter dated April 19, 2000. The Chester County Planning Commission was also notified at the same time. The Chester County Planning Commission provided some field chemistry and bacteriological data collected by the U.S. Geological Survey near the mouth of Beaver Creek. In addition, a representative of Trout Unlimited indicated that Beaver Creek supports a reproducing trout population. In response to this information, the Department sampled the fish community in Beaver Creek at two locations on May 24, 2000 and again at two different locations on July 10, 2001, as noted in the body of this report. The presence of a reproducing trout population was confirmed by these surveys.

### **RECOMMENDATIONS:**

Field survey data and temperature conditions of Beaver Creek indicate that the resident trout population is surviving and reproducing, despite the periodic occurrence of temperatures that approach the upper tolerance limits for trout. Based on these survey findings and data made available to the Department, the Department recommends that the Beaver Creek basin be designated Cold Water Fishes, Migratory Fishes (CWF, MF).

**TABLE 3**  
**TEMPERATURE<sup>1</sup> AND FISH OCCURANCE<sup>2</sup>**  
**BEAVER CREEK**  
**CHESTER COUNTY**

	Station ⇒		1BC			2BC	3BC	4BC	5BC
	PFBC	0101	0102		0103			0104	
Date ↓	Ch 93 CWF/TSF criterion (°F)			dam					
8/2/94	66/80	<b>68</b>						<b>68</b>	
8/3/94	"				<b>76</b>				
8/4/94	"		<b>72</b>						
7/28/98	66/74							<b>66.2</b>	
6/2/99	60/70							<b>69.8</b>	
7/20/99	66/87							<b>70.7</b>	
8/3/99	66/80							<b>68.9</b>	
8/17/99	66/87							<b>68.9</b>	
8/26/99	"							<b>67.1</b>	
9/14/99	64/84							63.5	
6/26/00	64/72						<b>69.6</b>	<b>68.4</b>	
7/14/00	66/74						62.6		
7/10/01	"							<b>70</b>	<b>70</b>
Brook <sup>2</sup>		-	-		-	S W		S	-
Brown <sup>2</sup>		-	-		W	W	S W	S W <b>S</b>	S W
Rainbow <sup>2</sup>		-	-		-	-	W	<b>S S</b>	-
American eel			<b>X X</b>		<b>X X</b>	X	X	<b>X X</b>	X

1 – Temperature data (°F)– Bold type = exceeds CFW temperature criterion

2 - DEP '00, '01 surveys – S (stocked), W (wild), X (present)

PFBC '94 survey – **S** (stocked), **W** (wild), **X** (present)



Species (Common Name)	July 14, 2000	May 24, 2000 <sup>^</sup>		July 14, 2000	June 26, 2000		July 10, 2001	
	1BC	1BC*	2BC*	3BC	3BC*	4BC*	4BC**	5BC*
Eels ( <i>Anguillidae</i> )								
American eel <i>Anguilla rostrata</i>	11	3	2	3	5	5	C	4

\* Approximate number of individuals captured and estimated length.

\*\* Relative abundances estimated for captured individuals; A = Abundant (>25); C = Common (10-24); P = Present (3-9); R = Rare (<3).

<sup>^</sup> Note: Stream was turbid from rain the preceding night, and flow was increased; Estimated to be ~ 20 to 30 cfs. Capturing fish was difficult.

**TABLE 1**  
**STATION LOCATIONS**  
**BEAVER CREEK**  
**CHESTER COUNTY**  
**May 24, 2000 thru July 10, 2001**

Station Label*	Station Location Descriptions
0101 <sup>1</sup>	Upstream of Swineheart Road (SR 4011) bridge.
1BC	Upstream of Hadfield Road (T-415), west of Bondsville in East Brandywine Township. This station was the uppermost DEP site on Beaver Creek.
0102 <sup>1</sup>	Upstream of Hadfield Road (T-415).
2BC	Upstream of Osborn Road (T-424), between the East Brandywine/Caln Township Boundary and US Route 30.
0103 <sup>1</sup>	Downstream of bridge on private road approximately 640 meters downstream of bridge on Bondsville Road (SR 4015).
3BC	Near Meadow Drive, off PA Route 340 (Bondsville Road) in Downingtown, PA.
4BC	Downstream of Lloyd Avenue in Downingtown, PA.
0104 <sup>1</sup>	Downstream from bridge on Lloyd Avenue (T-430).
5BC	Downstream of US 322 (Manor Avenue) in Downingtown, PA. This station was nearest the mouth of Beaver Creek where it empties into East Branch Brandywine Creek.
<p>*All stations were re-labeled after the July 10<sup>th</sup> survey to simplify station identification; however, the station locations and descriptions remain the same.  <sup>1</sup>PFBC 1994 survey stations.</p>	

**FIGURE 1**  
**STATION LOCATIONS**  
**BEAVER CREEK**  
**CHESTER COUNTY**  
**May 24, 2000 thru July 10, 2001**

