

**WEST BRANCH PERKIOMEN CREEK  
BERKS COUNTY**

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

**SEGMENT: BASIN  
DRAINAGE LIST: F  
STREAM CODE: 01439**

**WATER QUALITY MONITORING AND ASSESSMENT SECTION (DSB)  
DIVISION OF WATER QUALITY ASSESSMENT AND STANDARDS  
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**JUNE 2000  
REVISED JULY 2001**



## **GENERAL WATERSHED DESCRIPTION**

West Branch Perkiomen Creek (01439) is a tributary to Perkiomen Creek in the Schuylkill River watershed. The Department evaluated this basin from the source to the crossing of SR2069 (RMI 8.0). The candidate basin is located in District, Hereford, Longswamp, and Washington Townships, Berks County. This basin has a drainage area of 12.9 square miles and contains 18.1 stream miles. The candidate stream is currently designated Cold Water Fishes (CWF). In response to a petition submitted by the Berks County Conservancy and the District Township Supervisors, this watershed was evaluated for a possible redesignation to Exceptional Value Waters (EV). This evaluation is based on field surveys conducted in June and August 1999.

Land use in the candidate basin is a mixture of forested hillsides and low density residential and agriculture in the valleys. The small hamlet of Huffs Church is located in the upper part of the watershed and two sections of State Game Lands #315 are also present.

## **WATER QUALITY AND USES**

### **Surface Water**

No long-term water quality data were available to allow a direct comparison to water quality criteria. Grab samples were taken at four stations (Table 2). Water quality was generally good at all stations. Because 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 ecological significance.

There are no surface withdrawals for public water supply but two NPDES permitted discharges are located in the candidate watershed. Woodland Mobile Home Park (0055352) and Heilman, Scott (0084557) are both located in Hereford Township. They have permitted discharges of 0.014 and 0.0005 million gallons/day (mgd) respectively.

### **Aquatic Biota**

The total habitat scores for aquatic biota ranged from 174 to 196 at the three stations where biological sampling was conducted (Table 3). Instream habitat was generally good except at 1WBP, which was affected by low gradient and extensive agriculture. This has resulted in a lack of riffles and an increase of embeddedness and sediment deposition. The riparian zone has been degraded by human activities at all three stations. Benthic macroinvertebrate samples were collected at Stations 1WBP, 2WBP, and 4WBP during the June 1999 survey. The results of these sampling efforts are presented in Table 4. Benthic macroinvertebrates were collected using sampling techniques adapted from the EPA Rapid Bioassessment Protocols. Taxonomic diversity was reasonably good with an average of 36 total taxa per station. Several taxa that are intolerant of water quality degradation were common.

A total of 11 species of fish were collected at two stations (Table 5). Wild brown trout were common at both stations. The presence of young of the year brown trout proves natural reproduction of this species in the basin. The rest of the fish species present were a combination

of cold, cool, and warm water species. The Pennsylvania Fish and Boat Commission has designated the main stem West Branch Perkiomen Creek from SR1022 downstream to SR2069 and Unnamed Tributary 01455 (basin) as Class "A" Wild Trout Waters.

### **NATIONAL, STATE, REGIONAL, OR LOCAL SIGNIFICANCE**

There are no known portions of the candidate basin that exhibit the characteristics of outstanding national, state, regional, or local resource waters under the Department's regulatory criteria.

### **ECOLOGICAL OR RECREATIONAL SIGNIFICANCE**

Selected benthic macroinvertebrate community metrics were compared to a reference station with a comparable drainage area (Table 7). Both West Branch Perkiomen Creek and the reference stream, Pine Creek, are located in the Reading Prong subcoregion (58h). Pine Creek is a cold water fishery with an Exceptional Value (EV) designation in Chapter 93. 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 2WBP and 4WBP had biological condition scores greater than 92% of the reference station. This indicates waters with excellent ecological attributes. Station 1WBP in the headwaters of the basin had a score of 80% of the reference station score. This score is probably caused by degradation of the benthic habitat and lower gradient, not by poor water quality as evidenced by the significantly higher scores at the two stations farther downstream. Habitat parameters such as epifaunal substrate, embeddedness, riffle frequency, and bank condition and vegetative protection were all worse than at the other two stations.

### **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 December 25, 1999 (29 Pa.B 6524). A similar notice was also published in the Reading Eagle Times on December 27, 1999. In addition, District, Hereford, Longswamp, and Washington Townships were notified of the evaluation in a letter dated December 23, 1999. The Berks County Planning Commission was also notified at the same time.

Data on water chemistry was received from the Schuylkill Riverkeepers in response to these notices. They provided data on selected water chemistry parameters for one station in the candidate basin. This data was collected using Lamotte kits, which may not be accurate enough

to determine a criteria violation. In general, this data indicates very good water quality over the period November 1992 through April 1999.

The Department sent copies of this draft report along with a cover letter dated May 17, 2001 requesting comments within a 30-day period, to Joseph Hoffman, Director of the Berks County Conservancy, the Berks County Planning Commission, and District, Hereford, Longswamp, and Washington Townships. The only response received by the Department was from the Berks County Planning Commission, who concurred with the proposed recommendation.

## **RECOMMENDATIONS**

Based on applicable regulatory criteria the Department makes the following recommendations:

West Branch Perkiomen Creek basin (source to SR1022 crossing at RMI 12.9)

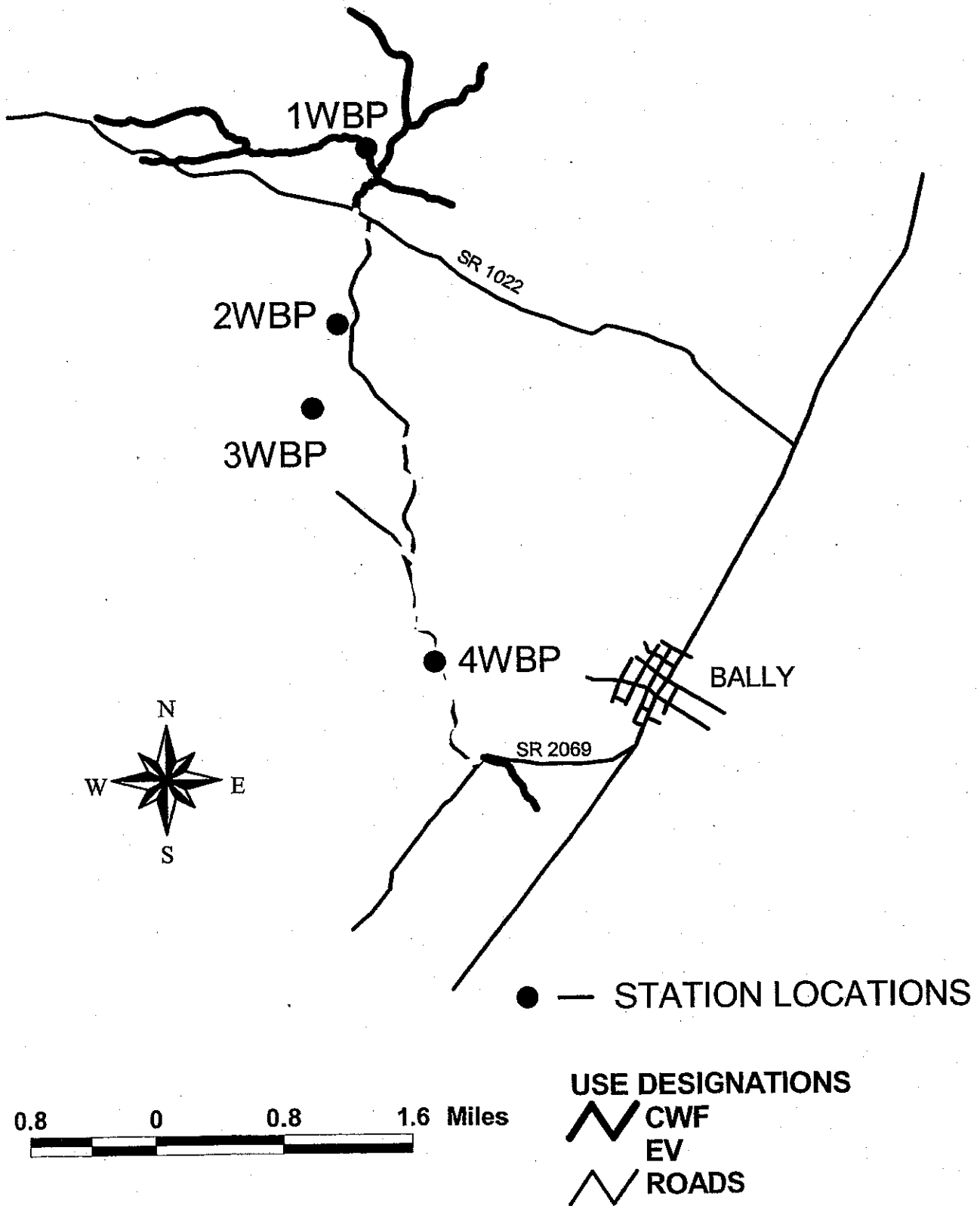
- Retain current CWF designation

West Branch Perkiomen Creek basin (SR1022 to SR2069 bridge at RMI 8.0)

- Change current CWF designation to EV
- Based on biological condition scores greater than 92% of the reference station
- Affects 12.4 stream miles

This designation provides less protection for the headwaters of this basin than the EV designation requested by the petitioner.

# FIGURE 1. WEST BRANCH PERKIOMEN CREEK BERKS COUNTY



**TABLE 1**  
**STATION LOCATIONS**  
**WEST BRANCH PERKIOMEN CREEK**  
**BERKS COUNTY**

<b>STATION</b>	<b>LOCATION</b>
<b>1WBP</b>	West Branch Perkiomen Creek approximately 20 meters downstream of T615. Hereford Township, Berks County Lat: 40 27 10 Long: 75 37 12 RMI: 13.54
<b>2WBP</b>	West Branch Perkiomen Creek approximately 20 meters upstream of T883. Hereford Township, Berks County Lat: 40 26 12 Long: 75 37 27 RMI: 12.02
<b>3WBP</b>	UNT West Branch Perkiomen Creek (01455) approximately 10 meters upstream of T870. Hereford Township, Berks County Lat: 40 25 44 Long: 75 37 38 RMI:
<b>4WBP</b>	West Branch Perkiomen Creek approximately 200 meters upstream of T650. Washington Township, Berks County Lat: 40 24 18 Long: 75 36 51 RMI: 8.25
<b>R1</b>	Pine Creek (01701) approximately 30 meters upstream of the T848 bridge. Pike Township, Berks County Lat: 40 24 45 Long: 75 44 01 RMI: 0.52

**TABLE 2**  
**WATER CHEMISTRY<sup>1</sup>**  
**WEST BRANCH PERKIOMEN CREEK, BERKS CO.**  
**AUGUST 5, 1999**

STATION	1WBP	2WBP	3WBP	4WBP
<b>Field Parameters</b>				
Temp (°C)	21.7	24.1	21.1	20.8
pH	7.5	7.5	7.8	8.1
Cond (µmhos)	169	196	170	201
Diss. O <sub>2</sub>	5.5	6.1	6.0	6.7
<b>Laboratory Parameters</b>				
pH	6.9	7.0	7.2	7.8
Alkalinity	44	48	52	82
Acidity	0	0	0	0
Hardness	57	63	62	87
T Diss. Sol.	166	168	174	158
Susp. Sol.	12	40	< 2	< 2
NH <sub>3</sub> -N	0.02	< .02	< .02	< .02
NO <sub>2</sub> -N	0.01	0.01	0.01	< 0.01
NO <sub>3</sub> -N	2.0	1.57	0.71	0.78
Total P	0.06	0.05	0.04	0.05
Ca	13.9	15.6	15.1	19.0
Mg	5.46	5.89	5.79	9.51
Cl	9	13	5	6
SO <sub>4</sub>	< 20	< 20	< 20	< 20
As*	< 4.0	< 4.0	< 4.0	< 4.0
As Diss	< 4.0	< 4.0	< 4.0	< 4.0
Cd*	< 0.2	< 0.2	< 0.2	< 0.2
Cd Diss	< 0.2	< 0.2	< 0.2	< 0.2
hex Cr*	<10	<10	<10	<10
Cr*	<50	<50	<50	<50
Cu*	< 4.0	< 4.0	< 4.0	< 4.0
Cu Diss	< 4.0	< 4.0	< 4.0	< 4.0
Fe*	346	225	82	112
Pb*	< 1.0	< 1.0	< 1.0	< 1.0
Pb Diss	< 1.0	< 1.0	< 1.0	< 1.0
Mn*	39	13	< 10	10
Ni*	< 4.0	< 4.0	< 4.0	< 4.0
Ni Diss	< 4.0	< 4.0	< 4.0	< 4.0
Zn*	< 5.0	< 5.0	< 5.0	< 5.0
Zn Diss	< 5.0	< 5.0	< 5.0	< 5.0
Al*	80	77	55	57
fecal coliforms	700	***	***	30

<sup>1</sup> - Except for pH & conductance and indicated otherwise, all values are total concentrations in mg/l

\* - Total concentrations in µg/l



**TABLE 3  
HABITAT ASSESSMENT SUMMARY  
WEST BRANCH PERKIOMEN CREEK  
BERKS COUNTY**

HABITAT PARAMETER	STATION <sup>1</sup>			
	1WBP	2WBP	4WBP	R1
1. instream cover	14	18	17	17
2. epifaunal substrate	16	17	18	18
3. embeddedness	12	16	16	16
4. velocity/depth	14	16	17	15
5. channel alterations	17	14	15	17
6. sediment deposition	16	17	16	16
7. riffle frequency	13	17	17	18
8. channel flow status	16	14	16	14
9. bank condition	16	12	17	15
10. bank vegetation protection	17	13	16	16
11. grazing/disruptive pressures	14	15	17	18
12. riparian vegetation zone width	9	12	14	19
Total Score	174	181	196	199
Rating <sup>2</sup>	SUB	SUB	OPT	OPT

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

<sup>2</sup> SUB = Suboptimal; OPT = Optimal

**TABLE 4**  
**BENTHIC MACROVERTEBRATE RESULTS**  
**WEST BRANCH PERKIOMEN CREEK, BERKS CO.**  
**June 10, 1999**

TAXA	STATION			
	1WBP	2WBP	4WBP	R1
<b>Ephemeroptera (mayflies)</b>				
Baetidae; <i>Acentrella</i>		C	P	P
<i>Baetis</i>	A	A	A	P
<i>Centroptilum</i>		P		
Ephemerellidae; <i>Drunella</i>	A	A	A	A
<i>Ephemerella</i>	A		P	C
<i>Serratella</i>	C	P	C	P
Heptageniidae; <i>Epeorus</i>	R	C	C	C
<i>Leucrocuta</i>		R	R	
<i>Stenacron</i>			C	
<i>Stenonema</i>	P	C	P	P
Leptophlebiidae; <i>Habrophlebiodes</i>	R			
<i>Paraleptophlebia</i>		C	A	P
Oligoneuriidae; <i>Isonychia</i>	C	P	P	P
<b>Plecoptera (stoneflies)</b>				
Leuctridae; <i>Leuctra</i>	C	C	A	P
Nemouridae; <i>Amphinemura</i>	C			
Peltoperlidae; <i>Pelto/Tallaperla</i>				R
Perlidae; <i>Acroneuria</i>	R	C	C	
<i>Eccopectera</i>	P			
<i>Paragnetina</i>				R
<i>Perlesta</i>	P	C	P	A
Perlodidae; <i>Isoperla</i>	C	P		P
Pteronarcyidae; <i>Pteronarcys</i>				P
<b>Tricoptera (caddisflies)</b>				
Brachycentridae; <i>Micrasema</i>		A	P	
Glossosomatidae; <i>Agapetus</i>	P			R
<i>Glossosoma</i>		P	C	P
Hydropsychidae; <i>Cheumatopsyche</i>		P		
<i>Diplectrona</i>	R	C	R	P
<i>Hydropsyche</i>	A	A	C	P
Lepidostomatidae; <i>Lepidostoma</i>	R			
Limnephilidae; <i>Apatania</i>	R			
<i>Frenesia</i>	R			
<i>Goera</i>			R	
<i>Pycnopsyche</i>	P			
Philopotamidae; <i>Dolophilodes</i>	C	C	C	A
Polycentropodidae; <i>Polycentropus</i>	R		R	R
Rhyacophilidae; <i>Rhyacophila</i>	P	R	P	C
Uenoidae; <i>Neophylax</i>	R			

TAXA	STATION			
	1WBP	2WBP	4WBP	R1
<b>Diptera (true flies)</b>				
Ephydriidae	R			
Simuliidae; <i>Simulium</i>	P	R	P	
Tipulidae; <i>Antocha</i>		P	P	P
<i>Dicranota</i>	C			P
<i>Hexatoma</i>	P	P		
<i>Tipula</i>	P	R		R
Chironomidae	C	C	A	A
<b>Megaloptera</b>				
Corydalidae; <i>Nigronia</i>	P			R
Sialidae; <i>Sialis</i>			P	
<b>Odonata (dragon-, damselflies)</b>				
Gomphidae; <i>Stylogomphus</i>	P	R		P
<b>Coleoptera (aquatic beetles)</b>				
Dryopidae; <i>Helichus</i>				R
Elmidae; <i>Dubiraphia</i>	R			
<i>Macronychus</i>	R			
<i>Optioservus</i>	A	C	A	P
<i>Oulimnius</i>	A	P	P	C
<i>Promoresia</i>	A	C		
<i>Stenelmis</i>	C		A	P
Psephenidae; <i>Ectopria</i>	R			
<i>Psephenus</i>	P	A	A	C
Ptilodactylidae; <i>Anchytarsus</i>	P			
Helophoridae; <i>Helophorus</i>	P			
<b>Non-Insect Taxa</b>				
Oligochaeta			P	R
Decapoda (crayfish)				
Cambaridae	R			
<i>Cambarus</i>		R	P	R
Gastropoda (univalves, snails)				
Physidae				R
Number of taxa in total sample	44	32	32	36

R=rare (<3 organisms); P=present (3-9 organisms); C=common (10-24 organisms);  
A=abundant (25-99 organisms); VA=very abundant (>99 organisms)

**TABLE 5**  
**FISHES**  
**WEST BRANCH PERKIOMEN CREEK**  
**BERKS COUNTY**

STATION	STATION	
	3WBP <sup>2</sup>	4WPB <sup>3</sup>
Brown trout, <i>Salmo trutta</i>	X	X
Common shiner, <i>Luxilus cornutus</i>	X	X
Cutlips minnow, <i>Exoglossum maxillingua</i>	X	X
Blacknose dace, <i>Rhinichthys atratulus</i>	X	X
Longnose dace, <i>Rhinichthys cataractae</i>	X	
Fallfish, <i>Semotilus corporalis</i>	X	X
Creek chub, <i>Semotilus atromaculatus</i>	X	
White sucker, <i>Catostomus commersoni</i>	X	X
Redbreast sunfish, <i>Lepomis auritus</i>	X	
Rock bass, <i>Ambloplites rupestris</i>	X	
Tessellated darter, <i>Etheostoma olmstedii</i>	X	X

1 - See Figure 1 and Table 1 for station locations

2 - Data from PA Fish and Boat Commission survey (July 1993)

3 - Data from DEP survey (10/21/99)

**TABLE 6**  
**SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA**  
**WEST BRANCH PERKIOMEN CREEK, BERKS CO.**  
**June 10, 1999**

TAXA	STATION			
	1WBP	2WBP	4WBP	R1
<b>Ephemeroptera (mayflies)</b>				
Baetidae; <i>Acentrella</i>		4	1	2
<i>Baetis</i>	10	11	9	
<i>Centroptilum</i>		1		
Ephemerellidae; <i>Drunella</i>	5	13	18	19
<i>Ephemerella</i>	9		2	3
<i>Serratella</i>	5	2	2	2
Heptageniidae; <i>Epeorus</i>		2	3	5
<i>Leucrocuta</i>		1		
<i>Stenacron</i>			3	
<i>Stenonema</i>	1	5		2
Leptophlebiidae; <i>Paraleptophlebia</i>		4	20	3
Oligoneuriidae; <i>Isorychia</i>	2	1	1	1
<b>Plecoptera (stoneflies)</b>				
Leuctridae; <i>Leuctra</i>	5	4	8	3
Nemouridae; <i>Amphinemura</i>	2			
Perlidae; <i>Acroneuria</i>		2	2	
<i>Perlesta</i>		4	1	12
Perlodidae; <i>Isoperla</i>	6	1		
Pteronarcyidae; <i>Pteronarcys</i>				1
<b>Tricoptera (caddisflies)</b>				
Brachycentridae; <i>Micrasema</i>		11		
Glossosomatidae; <i>Agapetus</i>	1			
<i>Glossosoma</i>			6	1
Hydropsychidae; <i>Cheumatopsyche</i>		1		
<i>Diplectrona</i>		3	1	
<i>Hydropsyche</i>	7	17	3	2
Philopotamidae; <i>Dolophilodes</i>	3	5	3	21
Polycentropodidae; <i>Polycentropus</i>	1			
Rhyacophilidae; <i>Rhyacophila</i>	1		1	1
<b>Diptera (true flies)</b>				
Simuliidae; <i>Simulium</i>	2		1	
Tipulidae; <i>Dicranota</i>	4			
<i>Hexatoma</i>	1	1		
<i>Tipula</i>				1
Chironomidae	2	3	10	20
<b>Megaloptera</b>				
Corydalidae; <i>Nigronia</i>	1			
Sialidae; <i>Sialis</i>			1	

TAXA	STATION			
	1WBP	2WBP	4WBP	R1
<b>Odonata (dragon-, damselflies)</b>				
Gomphidae; <i>Stylogomphus</i>				1
<b>Coleoptera (aquatic beetles)</b>				
Elmidae; <i>Dubiraphia</i>	1			
<i>Macronychus</i>	1			
<i>Optioservus</i>	13	3	13	1
<i>Oulimnius</i>	21	2	1	2
<i>Promoresia</i>	11	3		
<i>Stenelmis</i>	3		6	
Psephenidae; <i>Psephenus</i>		11	5	5
Ptilodactylidae; <i>Anchytarsus</i>	3			
Helophoridae; <i>Helophorus</i>	1			
<b>Non-Insect Taxa</b>				
Oligochaeta			2	1
Decapoda (crayfish)				
Cambaridae; <i>Cambarus</i>			1	

**TABLE 7**  
**RBP METRIC COMARISON**  
**WEST BRANCH PERKIOMEN CREEK**  
**BERKS COUNTY**

METRIC	STATION			
	1WBP	2WBP	4WBP	R1
1. TAXA RICHNESS	27	25	26	22
Cand/Ref (%)	123	114	118	***
Biol. Cond. Score	6	6	6	6
2. MOD. EPT INDEX	11	16	15	14
Cand/Ref (%)	79	114	107	***
Biol. Cond. Score	4	6	6	6
3. MOD. HBI	3.40	3.02	2.76	2.54
Cand-Ref	0.86	0.48	0.22	***
Biol. Cond. Score	4	6	6	6
4. % DOMINANT TAXA	17	15	16	19
Cand-Ref	-2	-4	3	***
Biol. Cond. Score	6	6	6	6
5. % MOD. MAYFLIES	18	29	40	34
Ref-Cand	16	5	-6	***
Biol. Cond. Score	4	6	6	6
TOTAL BIOLOGICAL CONDITION SCORE	24	30	30	30
% COMPARABILITY TO REFERENCE	80	100	100	***

