

**TROUT RUN**

**YORK COUNTY**

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

**Segment: Basin  
Drainage List: O  
Stream Code: 08035**

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

**JUNE 1995  
(revised July 1999)**



## BACKGROUND

The Trout Run basin is currently designated as Warm Water Fishes (WWF). The stream was evaluated in 1995 for possible re-designation to Exceptional Value Waters (EV) in response to a petition from Greg McCarren and Jackie Greenfield. Central Office staff conducted the stream survey on January 31, and February 1, 16, & 28, 1995. A report with EV recommendations was prepared later that year (DEP, June 1995).

The initial evaluation recommended an Exceptional Value Waters (EV) designation. Due to concerns and comments expressed during the proposed rulemaking process, it was decided that Trout Run would be re-surveyed. The most important concern to be addressed was the selection of an appropriate reference station to compare to Trout Run. Beaver Creek (03241), a tributary to Tinicum Creek in Bucks County, was originally chosen for macroinvertebrate metric comparisons based upon its EV designation, similar sized drainage area, and location within the same ecoregion (64-B) as Trout Run (Northern Piedmont Trap Rock and Conglomerate Sandstone Uplands). Despite these similarities, concerns were raised that Beaver Creek was not an appropriate reference stream because it did not support a viable cold water/trout community and was, therefore, too dissimilar for comparison to Trout Run, which supports trout. Therefore, another EV reference station of similar size and ecoregion, but with known cold water/trout conditions was needed. Segloch Run (07694, tributary to Furnace Run/Conestoga River, Lancaster County) was selected as the reference for the re-survey. Central Office staff, in the company of a local landowner and a consultant, revisited Trout Run on September 16, 1998 and sampled Segloch Run on September 21, 1998.

This report represents a combined review and discussion of pertinent information from the Department's 1995 report and additional information from the 1998 re-survey. Two new stations were visited in 1998 that are similar to, but not the same as, locations surveyed in 1995. As a result, in order to facilitate discussion and distinguish between the two surveys, the 1995 station labels (1TR, 2UNT, 3TR, & 4TR) were retained and 1998 station labels (1.5TR & 3.5TR) were added. The biological discussion in this report is based on data and results from the 1998 survey with an occasional reference to 1995 results. The biological metrics comparisons are based solely on the 1998 data.

## GENERAL WATERSHED DESCRIPTION

Trout Run is a tributary to Codorus Creek in the Susquehanna River drainage basin and is located approximately three miles east of the village of Mount Wolf in Hellam Township, York County (Figure 1). Trout Run is approximately 1.6 miles long and flows in a northwesterly direction. The estimated  $Q_{7-10}$  at the mouth is 0.03 cubic feet per second (CFS). This estimate is based on an average of the  $Q_{7-10}$  for two other small watersheds within the same part of the river basin, as listed in the available references. The 1.31 square mile drainage area (800+ acres) is mostly forested and comprised entirely of privately owned lands. The stream has very limited access and the basin is sparsely populated. The local ordinances or zoning restrictions concern rural and agriculture activities and do not specifically provide protective mechanisms for the surface water quality of Trout Run.

Impacts from human activities on Trout Run are very limited. The most noticeable impacts in the basin are swaths cut through the woods for a power-line and a pipeline. Both of these intersect the stream. Some lumbering activities occur on a limited, sporadic basis. Single family residences and lots for residences are present in the area.

## WATER QUALITY AND USES

### Surface Water

No long-term water quality data were available to allow a direct comparison to water quality criteria. The Department, however, did collect grab chemical samples and biological data from Trout Run during the September 1998 field survey. Two stations, 1.5- and 3.5TR, were sampled in 1998 (Figure 1 & Table 1).

Laboratory results of Trout Run surface waters are presented in Table 2. The grab sample results were generally better than criteria. The indigenous aquatic community is an excellent indicator of long-term conditions and is used as a measure of both water quality and ecological significance.

Despite the limitations of grab samples, observations can be made that provide a generalized overview of Trout Run's water quality. Based on hardness, alkalinity, calcium, and magnesium concentrations, the analysis results of the 2 grab samples suggest that Trout Run is a soft water system with low buffering capacity. All metals analyzed were below detection limits or well below Chapter 93 criteria values. Other tested parameters also exhibited low concentrations. Water chemistry information combined with field observations indicate that there currently is no noticeable environmental degradation to the water quality of Trout Run.

Bacterial samples were not collected during the 1998 survey because the 1995 results indicated that there were no significant problem sources of fecal contamination in the study area. In 1995, fecal coliform densities of < 20 per 100ml were recorded from water samples collected in the headwaters (1995 Station 1TR) and near the mouth (4TR). Fecal coliform density found in a small, intermittent, unnamed tributary (2UNT) was < 10 per 100ml.

Flow measured near the mouth in 1995 was 1.9 CFS. There are no National Pollutant Discharge Elimination System (NPDES) permitted discharges or wellhead protection areas in the basin. According to the Division of Water Planning and Allocations water use data system, there are no public water supply surface or ground water withdrawals in the basin.

### **Aquatic Biota**

Habitat and benthic macroinvertebrate data were collected from two stations in 1998. Instream habitat conditions were evaluated at each station where benthic macroinvertebrates were sampled. The habitat evaluation consists of rating twelve habitat parameters (Table 4) to derive a station habitat score. Total habitat scores (Table 3) for Trout Run were 170 (3TR) and 183 (4TR). Trout Run habitat scores were similar to that of Segloch Run (172).

**Benthos.** Trout Run supports a diverse benthic macroinvertebrate population and a limited fish population. Benthic macroinvertebrate samples were collected using the Department's PA-DEP RBPIII benthic sampling methodology. The PA-DEP RBPIII method is a modification of EPA's Rapid Bioassessment Protocols (RBPs; Plafkin, et al 1989). Macroinvertebrates collected in the Trout Run basin from Stations 1.5TR and 3.5TR (Table 4) revealed communities of 29 - 33 taxa. Six mayfly genera, 5 stonefly genera, and 12 caddisfly genera were taken from the stream. The upper station, 1.5TR, had a noticeably greater representation of mayfly and stonefly taxa than 3.5TR. Most of the macroinvertebrates collected are indicators of good water quality. The macroinvertebrate community is healthy, diverse, and contains a number of pollution sensitive genera indicating that the stream has not been subjected to chronic or acute degradation. Except for natural seasonality differences between the winter 1995 and September 1998 survey periods, these benthic results observations are similar to the Department's 1995 findings.

**Fish.** Four species of fish were captured in Trout Run during the Department's 1995 survey: brook trout, blacknose dace, creek chub, and bluegill (Table 5). Of these species, brook trout are considered "coldwater fishes" and creek chub and blacknose dace are more widely adaptive and temperature tolerant "coolwater fishes". Bluegills were found only near the mouth of the stream. These "warmwater fish" likely entered Trout Run from Codorus Creek. Overall, the Trout Run fishery is characterized by low density populations dominated by blacknose dace.

No fish were found in or near the intermittent headwaters despite the good flow, abundant macroinvertebrates, and adequate cover observed during the survey. Only a few scattered blacknose dace were observed in the upper mile of the stream in 1995. Fish populations in this stretch are probably limited by low flow conditions during long periods of reduced precipitation. Fish were more commonly found downstream of the confluence with the unnamed tributary represented by Station 2UNT. The fish data indicate that Trout Run supports cold water fishery uses throughout the permanently flowing lower 0.5 mile.

A small wild brook trout population was verified by the Pennsylvania Fish & Boat Commission during a March 1985 survey when 24 brook trout were captured in a 320 meter stretch of the stream. The population is vulnerable, and believed to be declining, perhaps due to poor reproduction over the past decade. This is supported by the fact that only three adult brook trout were captured by the Department on February 16, 1995

during approximately 300 yards of electrofishing.

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

Presently, there are no attributes that are of national, state, or local significance that would qualify Trout Run as EV waters under the Department's antidegradation regulations.

## **ECOLOGICAL OR RECREATIONAL SIGNIFICANCE**

This assessment of Trout Run included an ecological significance evaluation. Integrated benthic macroinvertebrate metric comparisons were done to compare Trout Run Stations to the Segloch Run reference station. Five benthic macroinvertebrate metrics were used to compare the samples: taxa richness, modified EPT index, modified HBI, percent dominant taxon, and modified percent mayflies (Table 6).

Based on these comparisons, the upper station (1.5TR) scored 87% and the lower station (3.5TR) scored 67% of the reference station score. The score for Station 1.5TR exceeds 83% comparability required for a High Quality (HQ) designation under the Department's antidegradation regulations. In order to qualify for an EV designation, comparison scores would have to exceed 92% of reference. The score for Station 3.5TR falls short of the minimum 83% score required for antidegradation designation.

## **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 York newspaper on December 27, 1999. In addition, Hellam Township was notified of the evaluation in a letter dated December 23, 1999. The York County Planning Commission was also notified at the same time. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notices. However, Hellam Township's Board of Supervisors, in a letter dated January 20, 2000, submitted comments opposing any change in Trout Run's WWF designated use.

Once the Department's evaluation of Trout Run was completed, a draft stream report was sent to the petitioners, Greg McCarren and Jackie Greenfield, Hellam Township, and the York County Planning Commission for their review and comment. This action was done on May 17, 2001. No comments were received by the Department.

## **RECOMMENDATIONS**

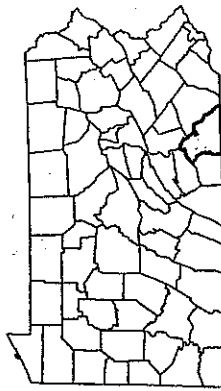
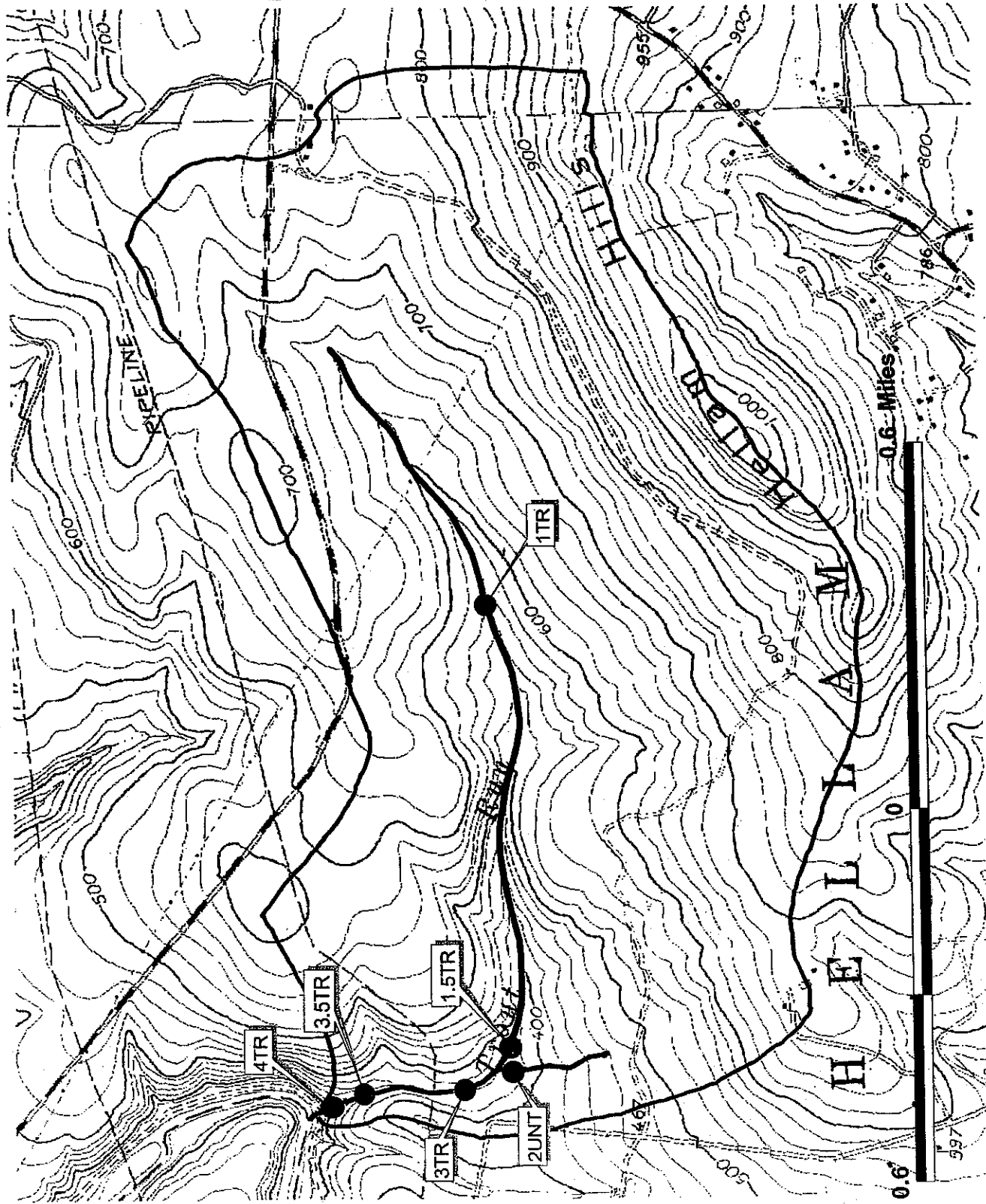
Based on applicable regulatory criteria, the Department recommends that a portion of the Trout Run basin's designated use be changed from Warm Water Fishes (WWF) to High Quality - Cold Water Fishes (HQ-CWF) and the remainder changed to Cold Water Fishes (CWF). The recommended revisions are as follows:

- Trout Run basin: source, to the confluence of an unnamed tributary at river mile 0.3;
  - change from WWF to HQ-CWF.
  - based on scoring more than 83% in comparison to the EV reference stream.
- Trout Run basin: from (and including) an unnamed, unmarked tributary at approximate river mile 0.3 to mouth;
  - change from WWF to CWF.
  - based on the presence of cold water fish species.

This recommendation affects approximately 1.6 stream miles - 1.3 miles as HQ-CWF and 0.3 miles as CWF.

## REFERENCES

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.



York County in gray

Use Designations  
 CWF  
 HQ-CWF  
 Trout run watershed

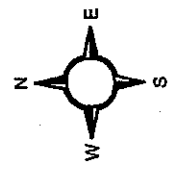


FIGURE 1. STATION LOCATIONS;  
 TROUT RUN WATERSHED, YORK CO.

**TABLE 1**  
**STATION LOCATIONS - TROUT RUN BASIN**  
**YORK COUNTY**

Station (year)	Stream Code	River Mile Index	Latitude/ Longitude	Location
<b>1TR</b> (1995)	08035	1.1	40'02'20" 76'38'20"	Approx. 400 yds. south of the powerline and Furnace Rd (SR66152) intersection.
<b>1.5TR</b> (1998)	08035	.3	40'02'17" 76'39'14"	Approx. 20 yards upstream from mouth of 2UNT.
<b>2UNT</b> (1995)	none	0.05	40'02'15" 76'39'16"	Approx. 100 yds. upstream of Station 3, near the midpoint of Trout Run.
<b>3TR</b> (1995)	08035	0.25	40'02'20" 76'39'17"	Approx. 200 yds. east of the intersection of T945 and T946. Near the Trout Run midpoint.
<b>3.5TR</b> (1998)	08035	.1	40'02'29" 76'39'18"	Approx. 150 yds. upstream from mouth.
<b>4TR</b> (1995)	08035	.01	40'02'32" 76'39'20"	30 yds. upstream from mouth.

Note: See Figure 1 for Relative Station Locations.



**TABLE 2**  
**WATER CHEMISTRY<sup>1</sup>**  
**TROUT RUN, YORK COUNTY**  
**September 16, 1998**

Station	1.5TR	3.5TR
Sample ID:	778	777
<b>Field Parameters</b>		
Temp (°C)	18.9	18.9
pH	6.2	6.8
Cond (µmhos)	31	33
Diss. O <sub>2</sub>	-	-
<b>Laboratory Parameters</b>		
pH	6.2	6.2
Alkalinity	7	7.6
Acidity	0	0
Hardness	<10	<10
T Diss. Sol.	18	40
Susp. Sol.	< 2	8
NH <sub>3</sub> -N	< .02	0.03
NO <sub>2</sub> -N	<.01	<.01
NO <sub>3</sub> -N	0.32	0.31
Total P	0.03	0.03
Ca	1.23	1.38
Mg	0.797	0.853
Cl	3	3
SO <sub>4</sub>	<20	<20
As - diss.*	< 4	< 4
- tot.*	< 4	< 4
Cd - diss.*	< .2	< .2
- tot.*	< .2	< .2
Cr - hex.*	< 10	< 10
- tot.*	< 50	< 50
Cu - diss.*	< 4	< 4
- tot.*	< 4	< 4
Fe - tot.*	89	175
Pb - diss.*	< 1	< 1
- tot.*	< 1	< 1
Mn - tot.*	20	20
Ni - diss.*	<4	<4
- tot.*	<4	<4
Zn - diss.*	<5	<5
- tot.*	<5	<5
Al - tot.*	64.4	88.7

1 - Except for pH & conductance and indicated otherwise, all values are in mg/l

\* - concentrations in µg/l

\*\* - Parameter notes: N series - NH<sub>3</sub> dependent on temperature + pH of sample;  
 NO<sub>2</sub> + NO<sub>3</sub> = 10 mg/l; Other metals are dependent on hardness.

**TABLE 3**  
**HABITAT ASSESSMENT SUMMARY**  
**TROUT RUN, YORK COUNTY**  
**September 16, 1998**

HABITAT PARAMETER	scoring range	STATIONS		
		1.5TR	3.5TR	Segloch Run reference
1 . instream cover	0 - 20	13	18	16
2 . epifaunal substrate	0 - 20	15	16	14
3 . embeddedness	0 - 20	11	11	9
4 . velocity/depth	0 - 20	10	16	13
5 . channel alterations	0 - 20	18	16	16
6 . sediment deposition	0 - 20	14	10	8
7 . riffle frequency	0 - 20	16	16	18
8 . channel flow status	0 - 20	13	15	15
9 . bank condition	0 - 20	12	16	16
10 . bank vegetation protection	0 - 20	12	13	16
11 . grazing/disruptive pressures	0 - 20	18	18	16
12 . riparian vegetation zone width	0 - 20	18	18	15
<b>Total Score</b>	<b>0 - 240</b>	<b>170</b>	<b>183</b>	<b>172</b>

**TABLE 4**  
**BENTHIC MACROINVERTEBRATE TAXA LIST<sup>1</sup>**  
**TROUT RUN, YORK COUNTY**

Station / Date	Segloch Run 980921	1.5TR 980916	3.5TR 980916
<b>MAYFLIES</b>			
Baetidae <i>Baetis</i>	C	P	-
EphemereIIDae <i>Eurylophella</i>	P	R	-
	P	-	-
Heptageniidae <i>Epeorus</i>	P	C	P
	-	A	C
	-	R	-
Isonychidae <i>Isonychia</i>	P	-	-
Leptophlebiidae	C	R	-
<b>STONEFLIES</b>			
Chloroperlidae <i>Sweltsa</i>	-	P	-
Leuctridae <i>Leuctra</i>	P	A	P
Peltoperlidae <i>Tallaperla</i>	A	C	P
Perlidae <i>Acroneuria</i>	C	A	C
Perlodidae	C	-	-
Pteronarcyidae <i>Pteronarcys</i>	-	C	C
<b>CADDISFLIES</b>			
Brachycentridae <i>Adicropheps</i>	-	P	-
	-	-	R
Glossosomatidae <i>Glossosoma</i>	R	R	R
	-	R	-
Hydropsychidae <i>Cheumatopsyche</i>	C	-	C
	VA	A	-
	C	A	A
Limnephilidae <i>Goera</i>	-	R	-
Philopotamidae <i>Dolophilodes</i>	VA	P	A
Polycentropodidae <i>Paranectophlyax</i>	-	-	R
	R	-	-
Psychomyiidae <i>Psychomyia</i>	-	-	R
Rhyacophilidae <i>Rhyacophila</i>	C	C	A
<b>TRUE FLIES</b>			
Ceratopogonidae	P	R	-
Chironomidae	C	A	A
Empididae <i>Chelifera</i>	R	-	-
Simuliidae <i>Simulium</i>	R	R	R
Tipulidae <i>Cryptolabis</i>	P	-	P
	P	P	P
	P	R	R
<b>MISC. INSECT TAXA</b>			
Elmidae <i>Optioservus</i>	P	C	P
	VA	VA	VA
	A	P	A
	-	R	-
Psephenidae <i>Ectopria</i>	P	A	C
	-	-	R
Gomphidae <i>Lanthus</i>	P	P	P
Corydalidae <i>Nigronia</i>	R	-	R
<b>NON-INSECT TAXA</b>			
Cambaridae	-	R	P
Hydracarina	R	R	-
Oligochaeta	-	P	R
Sphaeriidae	-	-	R
Turbellaria	R	-	-
Total # of taxa	32	33	29

**TABLE 5**  
**FISHES**  
**TROUT RUN, YORK COUNTY**  
**February 16, 1995**

Species	Stations		
	1TR	3TR	4TR
Brook Trout; <u>Salvelinus fontinalis</u>	-	X	X
Blacknose dace; <u>Rhinichthys atratulus</u>	-	X	X
Creek chub; <u>Semotilus atromaculatus</u>	-	-	X
Bluegill; <u>Lepomis macrochirus</u>	-	-	X
Total # of species	0	2	4

**TABLE 6**  
**SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE**  
**DATA AND RBP METRIC COMPARISONS**  
**TROUT RUN, YORK COUNTY**

Station / Date	Segloch Run	1.5TR	3.5TR
Taxa	980921	980916	980916
<b>MAYFLIES</b>			
Baetidae <i>Baetis</i>	2	1	-
EphemereIIDae <i>Eurylophella</i>	1	-	-
<i>Serratella</i>	2	-	-
Heptageniidae sp.	2	-	-
Heptageniidae <i>Epeorus</i>	1	3	-
<i>Stenonema</i>	-	7	5
Isonychidae <i>Isonychia</i>	1	-	-
Leptophlebiidae	3	-	-
<b>STONEFLIES</b>			
Chloroperlidae <i>Sweltsa</i>	-	2	-
Leuctridae <i>Leuctra</i>	1	6	1
Peltoperlidae <i>Tallaperla</i>	16	3	2
Perlidae <i>Acroneuria</i>	2	7	3
Periodidae	4	-	-
Pteronarcyidae <i>Pteronarcys</i>	-	3	5
<b>CADDISFLIES</b>			
Brachycentridae <i>Micrasema</i>	-	-	1
Glossosomatidae <i>Glossosoma</i>	1	1	-
Hydropsychidae <i>Cheumatopsyche</i>	3	-	2
<i>Diplectrona</i>	26	12	-
<i>Hydropsyche</i>	4	4	6
Philopotamidae <i>Dolophlodes</i>	21	4	7
Polycentropodidae <i>Paranyctophlyax</i>	-	-	1
<i>Polycentropus</i>	1	-	-
Psychomyiidae <i>Psychomyia</i>	-	-	1
Rhyacophilidae <i>Rhyacophila</i>	3	2	9
<b>TRUE FLIES</b>			
Chironomidae	4	15	12
Empididae <i>Chellifera</i>	1	-	-
Simuliidae <i>Simulium</i>	1	-	1
Tipulidae <i>Cryptolabis</i>	2	-	2
<i>Dicranota</i>	1	2	2
<i>Hexatoma</i>	2	1	1
<b>MISC. INSECT TAXA</b>			
Elmidae <i>Optioservus</i>	2	2	1
<i>Oulimnius</i>	24	27	29
<i>Promoresia</i>	9	1	5
Psephenidae <i>Ectopria</i>	1	5	2
Gomphidae <i>Lanthus</i>	-	1	1
Corydalidae <i>Nigronia</i>	-	-	1
<b>NON-INSECT TAXA</b>			
Cambaridae	-	-	1
Oligochaeta	-	2	1
Sphaeriidae	-	-	1
Total # of individuals	141	111	103
<b>Biological Condition Scoring</b>			
Metric			
RBP Taxa Richness	28	22	26
mEPT	15	12	10
mHBI	2.13	3.08	3.67
%dom	17.9	24.3	28.7
m %Mayfly	7.1	9	5
BCS total	30	26	20

