INDIAN CREEK

FAYETTE COUNTY

Stream Designation Evaluation Report
Water Quality Standards Review

Segment: Main Stem, confluence of Champion Creek to mouth
Drainage List: V
Stream Code: 38235

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

APRIL 2004

Indian Creek (38235)
Fayette County
Drainage List V

GENERAL WATERSHED DESCRIPTION

Indian Creek is a fourth-order tributary of the Youghiogheny River. The stream originates in the Forbes State Forest, in Donegal Township, Westmoreland County, just south of the Pennsylvania Turnpike, and flows approximately 28.1 miles in a southwesterly direction to its mouth (Figure 1). The entire Indian Creek basin drains approximately 125 square miles of the South Western Appalachians between the eastern facing slope of Chestnut Ridge and the western facing slope of Laurel Hill in the Unglaciated Allegheny High Plateau sub-ecoregion. While the headwaters are almost entirely forested, the land use of this particular reach, the main stem below Champion Creek, is low density residential to the town of Indian Head. Historically, this reach has been significantly impacted by acid mine drainage (AMD) from both abandoned surface and deep mines. The Kalp discharge is the largest source of AMD effluent draining into Indian Creek (Mountain Watershed Association, 1998). It enters the stream a mile south of Melcroft, discharging between 230 and 860 gallons per minute (gpm) and seriously degrades Indian Creek's water quality. Another large discharge is Gallentine, 1.5 miles below Indian Head, which discharges between 18 to 199 gpm.

Mill Run Reservoir is an impoundment on lower Indian Creek that has a surface area of approximately 0.10 square miles (64 square acres). The reservoir is relatively shallow due to heavy siltation and is currently not used as a public water source. Below Mill Run Reservoir, Indian Creek enters a forested, steep sided valley for almost 5 miles until it flows into the Youghiogheny River.

The Youghiogheny River is designated in Chapter 93 as High Quality-Cold Water Fishes (HQ-CWF) at its confluence with Indian Creek. The basin of Indian Creek to the confluence with Champion Creek is classified as HQ-CWF. All tributaries entering Indian Creek below Champion Creek are classified as Cold Water Fishes (CWF) or HQ-CWF.

This report evaluates approximately 17 miles of the main stem of Indian Creek between the mouth of Champion Creek and its confluence with the Youghiogheny River. This particular reach was inadvertently omitted from Chapter 93 during earlier revisions. The Department's Central Office staff conducted this stream survey during the period of July 24-26, 2001.

WATER QUALITY AND USES

Surface Water

Acidic and alkaline mine drainage into Champion Creek and Indian Creek, as well as effects of urbanization, degrade Indian Creek's water quality in this reach.

No long-term water quality data were available to allow a direct comparison to water quality criteria. However, chemical "grab" samples collected from six stations (Figure 1) on July 2, 2001 (Table 1) revealed nearly circumneutral stream pH (6.7~6.9). Considerable water quality data was obtained

through the public participation process, but no direct comparison of the chemistry data can be made to the Department's July 2, 2001 samples because the submitted data were not collected from comparable sampling sites. The data was informative, however, in helping characterize Indian Creek water quality. Despite the limitations of grab samples, observations can be made from Department and submitted data that provide a generalized water quality overview of the Indian Creek study area. Of note is the decreasing alkalinity and pH as the acidic mine discharge load increases downstream. Total iron, aluminum, and manganese levels also show elevated concentrations due to abandoned mine drainage sources upstream.

The only historical temperature data known to the Department is from September and October of 1965 and April of 1966, which was collected below Mill Run Reservoir by USEPA Region 3. That data show that CWF temperature criteria were exceeded in September 1965, but not in October of 1965 or April 1966. The limited extent of historical temperature data precludes proper characterization of the ambient thermal regime for the Indian Creek study area. Therefore, the indigenous aquatic community was used as a better indicator of long-term conditions and as a measure of aquatic life use.

Mountain Pines Camping Resort discharges into Indian Creek at a point approximately 17 miles upstream of the mouth of Champion Creek (permit #PA0034614). Pleasant View Mobile Home Park discharges into Indian Creek about one-half mile upstream (permit #PA0096733) and the Connellsville Area School District operates the Saltlick Township Elementary School sewage treatment plant (permit #PA0098345), which discharges into an unnamed tributary of Indian Creek.

Indian Creek Valley Water Authority is permitted to withdraw surface water from a point downstream from Indian Head, but only does so for emergency use during severe droughts.

Aquatic Biota

Fishes

An assessment of the physical habitat in this reach of Indian Creek revealed optimal habitat for aquatic biota (Table 2). The Pennsylvania Fish and Boat Commission (PFBC) documented the presence of a coldwater fishery in this segment of Indian Creek during an electrofishing survey conducted in 1994 (Table 3). At that time, the PFBC recommended that this segment be designated CWF. Electrofishing was conducted by the Department on July 23-26, 2001. Six electrofishing stations were established in this reach of Indian Creek for the assessment of aquatic life use (Figure 1). Two stations, 2IC and 6IC, were selected for comparison to PFBC surveys conducted in 1994 at the same locations.

At each section, 100-meter reaches were sampled using a Coffelt backpack AC electrofishing unit. The selected reaches contained the best available representative habitat and substrate heterogeneity. Water at all stations was clear, and flows were at their traditional summer lows. Table 3 presents the electrofishing results for the Department's July 2001 survey and the PFBC's 1994 survey.

Station 1IC is located at RMI 16.42 (River Mile Index = miles upstream of its mouth) and was designed to document aquatic fish use near the beginning of the reach. This station yielded the highest number of taxa (20) found during the study. Mottled sculpin was the most abundant species collected. A large stocked brown trout and a rainbow trout were also taken at this station.

Station 2IC (RMI 14.50) was sampled in order to compare data from the PFBC's 1994 survey (Section 0301). This location is approximately 1.5 miles downstream of the Kalp AMD discharge, and approximately 60 meters below the mouth of Back Creek. The influence of Back Creek, a higher quality tributary, helps to somewhat dilute the negative effects of the Kalp discharge. Two wild brook trout were captured here—a young-of-the-year age-class and an I+ age-class fish, respectively. Hatchery-reared brook trout (1), brown trout (1), and rainbow trout (2) were also captured at this site. Other species indicative of coldwater use were blacknose dace, longnose dace, and mottled sculpin. Similar species were collected during the 1994 PFBC survey.

Station 3IC (RMI 13.20) is located at the Indian Creek Valley Park. It represents Indian Creek conditions before receiving AMD influences from Poplar Run and the Gallentine discharge. Two wild young-of the-year brook trout were sampled at this station, as was a stocked rainbow trout. Blacknose dace and mottled sculpin were very abundant. Longnose dace were also present at this station.

Station 4IC (RMI 10.75) was placed approximately 100m below an old railroad bridge. Water quality conditions here reflect AMD impacts from Poplar Run and the Gallentine discharge upstream. Several brook trout and palomino (rainbow) trout were observed but not captured approximately 30 meters above the end of 4IC in a deep pool across from the mouth of Laurel Run. Abundance was noticeably lower in this section. Blacknose dace, longnose dace, and mottled sculpin were all collected at this station, however, in lower densities than 3IC. Northern hogsuckers were the most abundant fish collected, but also in lower densities than at 3IC.

Section 0302 (PFBC 1994, RMI 9.58) is located below the SR 653 bridge over Indian Creek above Stony Run at RMI 9.58. Construction activities and other habitat related conditions in the area precluded re-sampling this section in July 2001. The PFBC documented the presence of blacknose dace, longnose dace, and mottled sculpin at this site.

Station 5IC (RMI 6.11) is located above the Mill Run Reservoir and the SR 381 bridge crossing over Indian Creek. It represents aquatic life use conditions above the impoundment. As at all upstream stations, blacknose dace, longnose dace, and mottled sculpin were found at this site. Abundance and diversity were high.

Station 6IC (RMI 2.09) had the best physical fish habitat found at any other station in the study area. This station is difficult to sample, however, because of large boulders and rubble, deep holes, and swift current. It is located 30 meters upstream of the only access point to Indian Creek in the steep-sided valley below the reservoir. Blacknose dace were sampled at this station. River chub were collected here but not at any other station on Indian Creek. Generally, river chub presence is indicative of higher water quality and silt-free substrate. This species may be found in coolwater and warmwater habitats. They were present as well in the 1994 PFBC survey.

Four indigenous coldwater fish species, including brook trout (*Salvelinus fontinalis*), blacknose dace (*Rhinichthys atratulus*), longnose dace (*Rhinichthys cataractae*) and mottled sculpin (*Cottus bairdi*) were documented from two stations on Indian Creek, 2IC and 3IC. Even though impacted by AMD from Newmeyer Run, Poplar Run was documented to contain a naturally reproducing brook trout population (PFBC, 1994). Brook trout are tolerant of pH as low as 5.0 as long as dissolved aluminum concentrations stay below toxicity levels (generally <0.2 mg/L). During stressful periods, the brook trout could seek refuge in Indian Creek, or upstream of the confluence of Newmeyer Run. It is not certain whether the young-of-the-year brook trout captured at 2IC and 3IC were recruits from Popular Run or native to Indian Creek. However, their presence in Indian Creek during the summer months indicates that conditions were favorable for their maintenance.

Macroinvertebrates

Benthic macroinvertebrate data collected by Earle (2001) between May 1995 and June 1996 in Indian Creek at the town of Indian Head (nearest station 2IC), revealed a diverse macroinvertebrate community that included pollution sensitive as well as acid tolerant and intolerant taxa (Table 4). Of particular note was the presence of coldwater species such as stoneflies. There were 8 taxa collected during the study period.

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this designation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on April 14, 2001 (31 Pa.B 2074). A similar notice was also published in The Derrick and The Daily Courier on March 30, 2001. In addition, Saltlick and Springfield Townships and the Fayette County Planning Commission were notified of the evaluation in a letter dated March 23, 2001. Significant technical data on water quality, instream habitat, and the aquatic community were received in response to these notifications. Beverly Braverman of the Mountain Watershed Association furnished a remediation plan of the Indian Creek watershed, which included locational, chemical, and physical data on the most significant AMD discharges into Indian Creek. Jane Earle , PA DEP Bureau of Watershed Management, supplied benthic macroinvertebrate data on the Indian Creek watershed. Robin Lighty, PA DEP Bureau of Mining and Reclamation, supplied chemistry data at various sites in the Indian Creek watershed. Rick Lorsen, Fisheries Biologist, PFBC, supplied fish community data obtained in 1994 through electrofishing surveys.

RECOMMENDATIONS

Based on applicable regulatory criteria, the Department recommends that mainstem Indian Creek, from its confluence with Champion Creek to its mouth, be designated in Chapter 93 as Cold Water Fishes (CWF). This recommendation is based on the maintenance and propagation of fish species that are indicative of a cold water fishery use. This designation affects 16.94 stream miles.

REFERENCES

Bureau of Mining and Reclamation. 1995. Technical study document for a petition to designate areas unsuitable for mining: Petition 26949901 Indian Creek. DEP. Harrisburg, PA.

Earle, Jane I. 2001. Personal communication. Bureau of Watershed Management. DEP. Harrisburg, PA.

Lighty, Robin G. 1998. Chemical Analysis Results for Surface Water and Mine Discharges within the Indian Creek Watershed (unpublished report). Bureau of Mining and Reclamation, DEP. Harrisburg, PA.

Lorsen, Richard D. and David A. Miko. 1995. Indian Creek management report. PFBC. Somerset, PA.

_____. 1996. Comments and recommendations: Indian Creek. PFBC. Somerset, PA.

Mountain Watershed Association. 1998. The Indian Creek watershed comprehensive plan for acid mine drainage remediation. Melcroft, PA.

National Resources Conservation Service. 2000. Indian Creek watershed plan and environmental assessment. US Department of Agriculture. Harrisburg, PA.

Figure 1. Indian Creek Designation and Station Locations

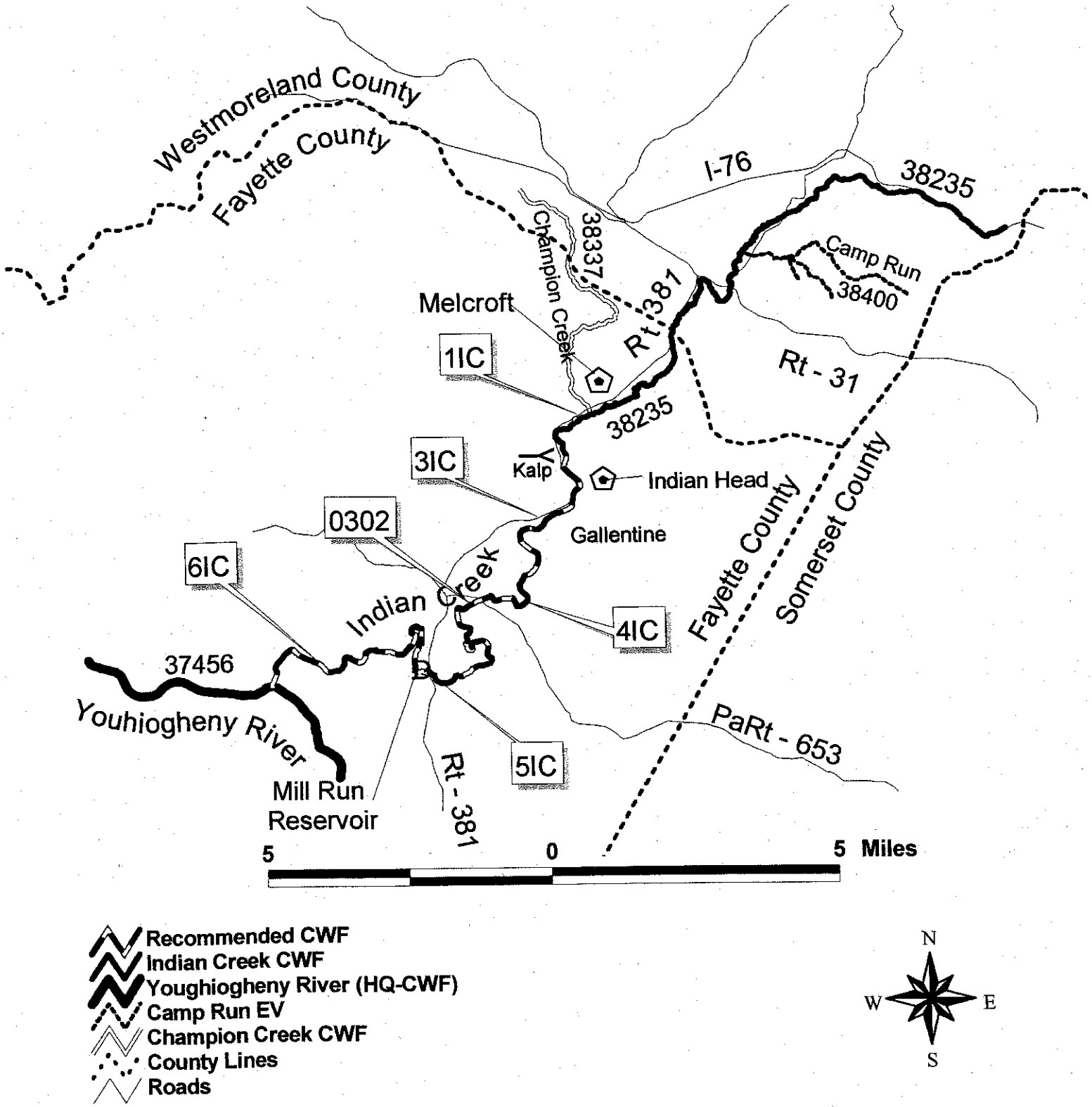

Table 1. Water Chemistry [1]
Indian Creek, Fayette County
July 2, 2001

STATION / Laboratory Parameters	1IC	2IC	3IC	4IC	5IC	6IC
pH	6.9	6.8	6.8	6.8	6.8	6.7
Alkalinity	30.0	28.0	28.0	24.0	24.0	22.0
Acidity	0.0	0.0	0.0	0.0	0.0	0.0
Hardness	68.6	73.5	71.0	81.8	81.4	75.5
T Diss. Sol.	220.0	222.0	200.0	200.0	190.0	164.0
Susp.Sol.	6.0	4.0	10.0	<2.0	12.0	14.0
NH_3-N	0.07	0.07	0.06	0.04	0.04	0.06
NO_2-N	0.02	0.02	0.02	0.02	0.02	0.02
NO_3-N	0.70	0.74	0.73	0.71	0.73	0.60
Total P	0.02	0.02	0.02	0.02	0.02	0.01
Ca	20.4	22.0	20.9	24.0	23.1	21.7
Mg	4.26	4.49	4.55	5.30	5.75	5.15
Cl	55.0	53.0	50.0	43.0	35.0	26.0
SO_4	73.6	49.3	37.4	31.3	33.7	31.7
As*	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
As Diss	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Cd*	<0.2	<0.2	<0.2	<0.2	1.5	<0.2
Cd Diss	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
hex Cr*	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cr*	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Cu*	4.4	<4.0	<4.0	<4.0	<4.0	<4.0
Cu Diss	<4.0	<4.0	<4.0	<4.0	4.1	<4.0
Fe*	1030	1280	1410	709	851	428
Pb*	<1.0	1.2	1.2	<1.0	<1.0	<1.0
Pb Diss	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Mn*	139	164	165	166	141	159
Ni*	7.6	8.8	8.2	6.7	6.5	<4.0
Ni Diss	5.1	7.3	6.5	5.6	5.3	<4.0
Zn*	14.3	15.8	14.6	9.1	11.3	5.3
Zn Diss	6	5.1	<5.0	<5.0	12.3	<5.0
Al*	413	483	441	346	357	198

[1] - Except for pH & indicated otherwise, all values are total concentrations in mg/l

* - Total concentrations in µg/l

Table 2, Habitat Assessment
Indian Creek, Fayette County
July 2, 2001

PARAMETER	1IC	2IC	3IC	4IC	5IC	6IC
1. instream cover (fish)	15	15	15	16	17	19
2. epifaunal substrate	14	15	15	15	17	18
3. embeddedness	11	14	14	15	16	18
4. velocity/depth regimes	14	16	15	16	16	18
5. channel alterations	16	9	14	15	17	18
6. sediment deposition	13	13	14	14	15	17
7. frequency of riffles	15	16	13	16	16	17
8. channel flow status	16	15	14	15	15	15
9. condition of banks	16	16	15	16	16	17
10. bank vegetation protection	16	13	13	15	17	18
11. vegetation disruptive pressure	15	13	10	16	17	18
12. riparian vegetation zone width	14	12	10	15	18	19
TOTAL HABITAT SCORE	175	167	162	184	197	212

Table 3. Electrofishing Results[1]
Indian Creek, Fayette County

	station	1IC	2IC		3IC	4IC	0302	5IC	6IC	
	River Mile Index (RMI)	16.42	14.50		13.20	10.75	9.58	6.11	2.09	
	sample source [2]	CO	CO	PFBC	CO	CO	PFBC	CO	CO	PFBC
Oncorhynchus mykiss ,	rainbow trout	1[3]	2[3]	X	1[3]	-	-	-	-	-
Salmo trutta ,	brown trout	1[3]	1[3]	-	-	-	-	-	-	-
Salvelinus fontinalis ,	brook trout	-	1[3],3[4]	X	2[4]	-	-	-	-	-
Catastomus commersoni ,	white sucker	C	C	-	C	-	X	R	-	-
Hypentelium nigricans ,	N. hogsucker	P	C	X	A	C	X	P	R	X
Moxostoma erythrurum ,	golden redhorse	-	-	X	-	-	-	-	-	-
Luxilus cornutus ,	common shiner	-	-	-	-	-	X	-	-	-
L. chrysocephalus ,	striped shiner	P	P	-	P	-	-	-	-	-
Notropis hudsonius ,	spottail shiner	C	-	-	-	-	-	-	-	-
N. stramineus ,	sand shiner	-	-	-	-	R	-	R	-	-
Rhinichythys atratulus ,	blacknose dace	C	R	X	A	R	X	P	P	-
R. cataractae ,	longnose dace	R	R	X	P	R	X	P	-	-
Semotilus atromaculatus ,	creek chub	P	P	X	C	R	X	-	-	-
Nocomis micropogon ,	river chub	-	-	-	-	-	-	-	C	X
Ambloplites rupestris ,	rock bass	R	R	-	-	-	X	R	-	-
Lepomis macrochirus ,	bluegill	R	-	-	-	-	-	-	-	-
L. sp. ,	sunfish hybrid	R	-	-	-	-	-	-	-	-
L. cyanellus ,	green sunfish	R		-	-	-	-	P	-	-
Micropterus dolomieui ,	smallmouth bass	P	P	-	-	-	X	P	C	X
Cottus bairdi ,	mottled sculpin	VA	P	X	A	P	-	P	-	-
Etheostoma nigrum ,	johnny darter	VA	-	X	A	-	X	P	R	-
E. flabellare ,	fantail darter	P	-	-	P	-	X	P	R	X
Pimephales notatus ,	bluntnose minnow	C	-	-	C	R	X	P	-	-
Ameiurus natalis	yellow bullhead	-	-	-	-	-		P	-	-
Ericymba buccata ,	silver jaw minnow	P	-	-	-	-	-	-	-	-
Campostoma anomalum ,	central stoneroller	A	P	X	A	P	X	P	P	-
	TOTAL TAXA	20	14	10	13	7	12	14	7	4

1 - Trout species abundances shown as numerical totals for the station or as legal/sublegal totals (#/#)
Abundances for the rest of the fishes are relative:
VA - very abundant; >100
A - abundant; 25-100
C - common; 10-24
P - present; 3-9
R - rare; 1-2

2 - CO: Central Office; July 2001
- PFBC: PA Fish & Boat Commission; August 1994 (X denotes presence of species)

3 - Native

4 - Hatchery Raised

Table 4. Macroinvertebrate Data[1]
Indian Creek, Fayette Co.

TAXA	DATE						
	05/24/95	06/14/95	07/30/95	09/20/95	10/25/95	12/06/95	06/04/96
Ephemeroptera (mayflies)							
Baetidae; *Acentrella*	8	13	3				1
Baetis	1	3	1			2	4
Ephemerellidae; *Attenella*	5	9	1			10	
Drunella	1						3
Ephemerella	6	1	1			1	19
Heptageniidae; *Cinygmula*		1					
Epeorus		1					3
Stenonema						1	1
Isonychiidae; *Isonychia*						1	1
Leptophlebiidae; *Paraleptophlebia*	1						
Plecoptera (stoneflies)							
Capniidae; *Allocapnia*					3	7	
Nemouridae	3						2
Amphinemura	2	1					16
Perlidae; *Acroneuria*			1	1			
Isoperla							7
Remenus							1
Taeniopterygidae; *Taeniopteryx*					22	20	
Tricoptera (caddisflies)							
Hydropsychidae; *Cheumatopsyche*					2	3	1
Diplectrona						1	
Hydropsyche	4	4	52	94	47	14	1
Hydroptilidae; *Ochrotrichia*		1					
Rhyacophilidae; *Rhyacophila*		1					
Diptera (true flies)							
Empididae; *Hemerodromia*	2	7	2	1	1		5
Tipulidae							1
Antocha			1			1	
Dicranota							1
Tipula					1	6	
Chironomidae	78	43	37	1	1	5	12
Megaloptera (dobson-, fishflies)							
Corydalidae; *Nigronia*		2	1	1	1	1	
Odonata (dragon-, damselflies)							
Aeshnidae; *Lanthus*				1			
Coleoptera (aquatic beetles)							
Elmidae	1	3	4	8	16	11	5
Non-Insect Taxa							
Asellidae; *Caecidotea*							1
Planorbidae						4	
Total Number Taxa	12	13	11	7	9	17	20
Number of Grids	14	23	8	20	27	28	21
Subsample Size	110	103	106	105	104	90	107

[1] **Source: Earle (2001)**