

November, 2007



Environmental
Protection Agency

Division of Surface Water

Status of Craborchard Cr. (Harrison Co.) and Sugartree Fork (Guernsey Co.)

Red Hill Farms Area

2006 Biological and Physical Habitat Assessment



OHIO EPA Technical Report EAS/2007-11-8

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Assessed By
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Introduction

In 1991, waters that course through and drain Red Hill Farms were subjected to significant directed physical modification by the property owner. These activities included stream relocation, direct channelization and other related drainage modifications; and were planned and executed without legal authorization from the relevant governmental agencies having jurisdiction over waters of the State. To appraise the potential environmental damage to the waters so affected, monitoring and assessment efforts were initiated by the Ohio EPA in 1992 on Craborchard Creek, Sugartree Fork, and Turkey Run. To date, these streams have been surveyed and assessed by Ohio EPA for the years 1992, 1994, 1997, 1998, and 2006. Collectively, the resulting data were used to perform an audit of pertinent riparian and channel features and their attendant effects upon ambient biological performance through time, with the express goal of determining compliance with the biological endpoints set forth in a Consent Decree resulting from State of Ohio vs. Floyd E. Kimbal et al. (January 31, 2000).

Biological community (fish and macroinvertebrates) and physical habitat data were collected, analyzed, and assessed from two Craborchard Creek sites, two Sugartree Fork sites, and one Turkey Run site during 2006 using standard Ohio EPA field and laboratory sampling protocols and assessment procedures (Ohio EPA 1987a, 1987b, 1989a, 1989b, 2006a, 2006b, 2006c; Rankin 1989). Sampling locations were at or near sites collected in previous years and are as follows.

Stream	River Mile (RM)	Landmark	USGS Topo. Map
Craborchard Creek	3.5 (macros. only)	Upst. Hoop Rd., Harrison Co.	Freeport, OH
	1.9 (fish only)	Twp. Rd. 116	Freeport, OH
	0.7	Dst. CR 10, Harrison Co.	Freeport, OH
Sugartree Fork	14.7	Jeffers Lane, Guernsey Co.	Birmingham, OH
	13.4	Tuttle Rd., Guernsey Co.	Birmingham, OH
Turkey Run	0.4	Adj. Rainbow Rd.	Birmingham, OH

An attainment table incorporating all sampling between 1992 and 2006 is attached (Table 1). Summarized (all years) and raw data (2006 only) for physical habitat, fish, and macroinvertebrates are attached as Tables 2-6.

Physical Habitat for Aquatic Life

As measured by the QHEI, macrohabitat quality through the modified segment of Craborchard Creek has improve significantly since 1992. This phenomenon was most pronounced at RM 0.7, a station common to all field years, where conditions have gone from very poor (QHEI=20.5) in 1992 to marginally good (QHEI=52.0) in 2006. Although far from representing ideal stream habitat, the profound and debilitating level of habitat simplification documented in 1992 was largely abated by 2006.

By and large, measures of macrohabitat quality from Sugartree Fork suggest improvements similar to those in Craborchard Creek. Although post modification conditions in 1992 were not nearly as deficient, QHEI scores from the affected reach of Sugartree Fork improved to a level associated with WWH communities (QHEI=59.0). Limited macrohabitat recovery was documented in the affected Sugartree Fork tributary, Turkey Run. Between 1992 and 1998, the performance of the QHEI at RM 0.4 advanced a full 13 points, from 21.5 to 34.5, respectively. Unfortunately, macrohabitat data were not collected from this station in 2006. However, based upon the improving trend observed for the other stream segments within the Red Hill Farm study area, it is likely that the current condition of Turkey Run is better than that documented in 1998.

Fish Communities

Summarized 2006 results from the five sampling locations are as follows.

River Mile	Number of Species	Relative Number (No./0.3 km)	QHEI	2006 IBI (Baseline 1998 Score)	2006 Narrative Evaluation
Craborchard Creek (WWH-Warmwater Habitat Aquatic Life Use)					
1.9	23	2604	64.5	40 (43)	Marginally Good
0.7	19	1052	52.0	42 (40)	Marginally Good
Sugartree Fork (WWH-Warmwater Habitat Aquatic Life Use)					
14.7	20	1119	77.5	48 (47)	Very Good
13.4	25	1160	59.0	40 (34 ¹)	Marginally Good
Turkey Run (WWH-Warmwater Habitat Aquatic Life Use)					
0.4	22	4529	-	42 (40)	Marginally Good

¹ Score from RM 12.9 in 1998.

As measured by the IBI, performance of the fish community throughout Craborchard Creek was found fully consistent with the applicable WWH biocriterion in 2006. Impairments documented in 1992, associated with the unauthorized drainage modifications, were largely recovered by 1998. At stations common to both the 1998 and 2006 surveys, the condition of the fish community has remained virtually unchanged, the very modest discrepancies between IBI scores for the two field years remaining well-within the known variability of the IBI. Increases in IBI scores between 1992 and 2006 were attributable to increases in the number of environmentally sensitive species, lithophilic species, and headwater adapted species.

Through the affected reaches of Sugartree Fork and Turkey Run, the structural and functional organization appeared relatively stable. Significant disruptions to the fish community did not emerge in 1992, and, by and large, communities consistent with the applicable WWH biocriterion were observed at most sites through most years. Despite the habitat impacts documented in 1992, and in some areas, limited physical recovery, community performance, as reflected by IBI scores, has not exceeded the range of non-significant departure from the WWH biocriterion. The apparent non-responsive nature of the fish assemblage within these streams, compared with Craborchard Creek, appears related to stream size and ground water flow. The Ohio EPA has, over many years and in a very wide range of settings, observed the highly beneficial nature of ground water augmentation for small headwaters (typically ≥ 5 miles²). At times and under specific conditions, the resulting strong surface flow has been shown to compensate for deficient macrohabitat, allowing an otherwise physically substandard stream to support an assemblage of aquatic organisms significantly better than the habitat, as measured by QHEI scores, would predict.

Macroinvertebrate Communities

Summarized 2006 results from the five sampling locations are as follows.

River Mile	Density (#/ft ²) ¹	Quantitative Taxa ¹	Qualitative Taxa ²	Qualitative EPT Taxa ^{2,3}	Pollution Sensitive Taxa ⁴	Total Taxa ⁴	2006 ICI (Baseline 1998 Score)	2006 Narrative Evaluation
Craborchard Creek (WWH-Warmwater Habitat Aquatic Life Use)								
3.5	731	55	69	22	35	93	50 (56)	Exceptional
0.7	411	50	66	24	43	88	56 (56)	Exceptional
Sugartree Fork (WWH-Warmwater Habitat Aquatic Life Use)								
14.7	99	40	47	21	36	70	56 (48)	Exceptional
13.4	341	57	53	22	42	85	52 (54)	Exceptional
Turkey Run (WWH-Warmwater Habitat Aquatic Life Use)								
0.4	664	48	55	25	38	77	52 (52 ⁵)	Exceptional

¹ From artificial substrate sample. ² From natural substrate collection. ³ Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) taxa diversity. ⁴ Combined artificial and natural substrate collections. ⁵ Mean of two 1992 scores.

Macroinvertebrate results from 2006 reflected comparable community quality compared to data collected during the 1998 baseline survey as well as the initial 1992 survey at similar locations. During all years, very good to exceptional communities were collected at sampling locations using both the artificial substrate and the natural substrate collecting protocols. All 2006 Invertebrate Community Index (ICI) scores exceeded both the WWH (36) and EWH (46) aquatic life use biocriteria at the five sites. Numbers of pollution sensitive taxa collected at the sites were high and ranged from 35 to 43 out of a total taxa range of 70 to 93. These results were clear indications that water quality in Craborchard Creek, Sugartree Fork, and Turkey Run was of sufficiently high quality to support diverse populations of macroinvertebrates in those lotic areas with optimal microhabitat (substrate and stream flow) conditions.

Table 1. Aquatic life use attainment status for stations sampled in the Craborchard Creek, Sugartree Fork, and Turkey Run watersheds, July-October, 1992 - 2006. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support a biotic community.

River Mile Fish/Invert.	IBI	MIwb ^a	ICI ^b	QHEI	Attainment Status ^b	Comment
<i>Western Allegheny Plateau - WWH (existing)</i>						
Craborchard Creek (2006)						
- /3.5	-	-	50	-	(Full)	Hoop Rd.
1.9/ -	40 ^{ns}	NA	-	64.5	(Full)	Twp. Rd. 116
0.7/0.7	42 ^{ns}	NA	56	52.0	Full	Dst. Co. Rd. 10
Craborchard Creek (1998)						
- /3.5	-	-	56	-	(Full)	Hoop Rd.
1.9/ -	43 ^{ns}	NA	-	51.0	(Full)	Twp. Rd. 116
1.5/ -	38*	NA	-	46.5	(NON)	Dst. Twp. Rd. 116
0.9/ -	49	NA	-	37.0	(Full)	Ust CR 10
0.7/0.7	40 ^{ns}	NA	42/56	37.5	Full	Dst CR 10
Craborchard Creek (1997)						
1.9/ -	38*	NA	-	-	(NON)	Twp. Rd. 116
0.9/ -	38*	NA	-	28.5	(NON)	Ust CR 10
0.7/ -	38*	NA	-	30.0	(NON)	Dst CR 10
Craborchard Creek (1993)						
1.9/ -	34*	NA	-	-	(NON)	Twp. Rd. 116
0.9/ -	40 ^{ns}	NA	-	-	(Full)	Ust CR 10
0.7/ -	32*	NA	-	-	(NON)	Dst CR 10
Craborchard Creek (1992)						
3.5/3.5	32*	NA	44	25.5	Partial	Hoop Rd.
1.9/1.8	32*	NA	40	60.0	Partial	Twp. Rd. 116
0.9/0.9	38*	NA	48	57.5	Partial	Ust CR 10
0.7/0.3	34*	NA	54/52	20.5	Partial	Dst CR 10
Sugartree Fork (2006)						
14.7/14.7	48	NA	56	77.5	Full	Jeffers Lane
13.4/13.4	40 ^{ns}	NA	52	59.0	Full	Tuttle Rd.
Sugartree Fork (1998)						
14.7/14.7	47	NA	48	75.5	Full	Jeffers Lane
14.1/ -	43 ^{ns}	NA	-	51.0	(Full)	Upst. Turkey Run
- /13.4	-	-	54/54	-	(Full)	Tuttle Rd.
12.9/ -	34*	NA	-	55.5	(NON)	Dst. Tuttle Rd.
12.2/ -	38*	NA	-	71.5	(NON)	Birmingham Rd.

Table 1. (Continued)

River Mile Fish/Invert.	IBI	MIwb ^a	ICI ^b	QHEI	Attainment Status ^b	Comment
Sugartree Fork (1993)						
14.7/ -	44	NA	-	-	(Full)	Jeffers Lane
14.1/ -	42 ^{ns}	NA	-	-	(Full)	Upst. Turkey Run
12.9/ -	38*	NA	-	-	(NON)	Tuttle Rd.
12.2/ -	36*	NA	-	-	(NON)	Birmingham Rd.
11.1/ -	30*	NA	-	-	(NON)	Gunn Rd.
Sugartree Fork (1992)						
14.7/14.7	39*	NA	58	77.5	Partial	Jeffers Lane
14.1/14.1	42 ^{ns}	NA	52	44.5	Full	Upst. Turkey Run
13.0/13.4	33*	NA	56	41.5	Partial	Tuttle Rd.
12.2/12.2	30*	NA	54	78.5	Partial	Birmingham Rd.
11.1/11.1	36*	NA	50	66.5	Partial	Gunn Rd.
Turkey Run (2006)						
0.4/0.4	42 ^{ns}	NA	52	-	Full	Adj. Rainbow Rd. (Dst.)
Turkey Run (1998)						
0.6/ -	46	NA	-	91.5	(Full)	Adj. Rainbow Rd. (Upst.)
0.4/ -	40 ^{ns}	NA	-	34.5	(Full)	Adj. Rainbow Rd. (Dst.)
Turkey Run (1993)						
0.6/ -	44	NA	-	-	(Full)	Adj. Rainbow Rd. (Upst.)
0.4/ -	40 ^{ns}	NA	-	-	(Full)	Adj. Rainbow Rd. (Dst.)
Turkey Run (1992)						
0.6/0.9	43 ^{ns}	NA	60	71.0	Full	Adj. Rainbow Rd. (Upst.)
0.4/0.4	41 ^{ns}	NA	50/54	21.5	Full	Adj. Rainbow Rd. (Dst.)

Biological Criteria

(from OAC 3745-1-07, Table 7-15)

Ecoregion Index-Site Type	Western Allegheny Plateau (WAP)		
	EWB	WWH	MWH ^c
IBI-Headwaters	50	44	24
ICI	46	36	22

a The Modified Index of Well-being is not applicable (NA) to headwater site types.

b Use attainment status based on one organism group is parenthetically expressed.

c Modified Warmwater Habitat criteria for channel modified habitats.

* Indicates significant departure from applicable biocriteria (>4 IBI or ICI units, or >0.5 MIwb units).
Underlined scores are in the Poor or Very Poor range.

ns Nonsignificant departure from biocriteria (≤4 IBI or ICI units, or ≤0.5 MIwb units).

Table 2. Qualitative Habitat Evaluation Index (QHEI) attributes for sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes									Total WWH Attributes	MWH Attributes				Total MLL MWH Attributes	(MWH(LL+1)/(WWH+1) Ratio	(MWH(LL+1)/(MWH(H+1) Ratio											
			No Channelization or Recovered Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Rifle Embeddedness		Channelized or No Recovery Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)				Total HLL MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Med. Overall Embeddedness
(17-359) Craborchard Creek																														
Year: 2006																														
1.9	64.5	9.52	■		■	■	■		■	■	6	◆			1	●							●		●	●	●	4	0.29	0.86
0.7	52.0	9.52						■	■		2	◆	◆	◆	3	●	●		●				●		●	●	●	6	1.33	3.33
Year: 1998																														
1.9	51.0	9.52	■		■	■	■		■		5	◆		◆	2	●			●				●		●	●	●	5	0.50	1.33
1.5	46.5	9.52	■			■	■	■		■	5	◆			1	●	●	●	●				●		●	●	●	6	0.33	1.33
0.9	37.0	9.52		■						■	2	◆	◆	◆	3	●	●	●		●			●		●	●	●	8	1.33	4.00
0.7	37.5	9.52	■								1	◆	◆	◆	4	●	●		●				●		●	●	●	7	2.50	6.00
Year: 1997																														
0.9	28.5	9.52		■							1	◆	◆	◆	5	●	●	●	●				●		●	●	●	7	3.00	6.50
0.7	30.0	9.52									0	◆	◆	◆	4	●	●	●	●				●		●	●	●	7	5.00	*. **
Year: 1992																														
3.5	25.5	8.39									1	◆	◆	◆	5	●	●	●					●		●	●	●	7	3.00	6.50
1.9	56.5	9.52	■		■	■	■		■		5	◆			1	●							●		●	●	●	4	0.33	1.00
1.9	60.0	9.52	■		■	■	■	■		■	6	◆			1	●		●					●		●	●	●	5	0.29	1.00
1.9	60.0	9.52	■		■	■	■	■		■	6	◆			1	●							●		●	●	●	3	0.29	0.71
1.9	63.5	9.52	■		■	■	■	■		■	6	◆			1	●	●	●					●		●	●	●	5	0.29	1.00
1.3	49.5	9.52	■		■	■	■		■		5	◆			1	●	●						●		●	●	●	5	0.33	1.17
0.9	57.5	9.52	■	■		■	■		■		5	◆		◆	2	●	●	●					●		●	●	●	5	0.50	1.33
0.8	22.0	9.52									0	◆	◆	◆	5	●		●					●		●	●	●	7	6.00	*. **
0.7	20.5	9.52									0	◆	◆	◆	5	●	●	●	●				●		●	●	●	7	6.00	*. **
0.1	25.0	9.52								■	1	◆	◆	◆	4	●	●	●	●				●		●	●	●	7	2.50	6.00
(17-821) Sugartree Fork																														
Year: 2006																														
14.7	77.5	20.00	■		■	■	■		■	■	7				0								●					1	0.13	0.25
13.4	59.0	14.18				■			■	■	3		◆	◆	2	●	●		●				●		●	●	●	6	0.75	2.25
Year: 1998																														
14.7	75.5	20.00	■	■		■	■	■		■	8				0	●			●				●		●	●	●	5	0.11	0.67
14.1	51.0	20.00		■			■		■		3	◆		◆	3	●	●		●				●		●	●	●	6	1.00	2.50
12.9	55.5	14.18		■			■		■		3	◆		◆	3	●	●		●				●		●	●	●	6	1.00	2.50
12.2	71.5	6.02	■	■		■	■	■		■	6				0	●			●				●		●	●	●	5	0.14	0.86
Year: 1994																														

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes										MWH Attributes																							
			Key QHEI Components										High Influence					Moderate Influence					Total MLL MWH Attributes	(MWH+1)/(MWH+1) Ratio	(MWH+1)/(MWH+1) Ratio											
			No Channelization or Recovered Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrates	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	Total WWH Attributes	Channelized or No Recovery Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total HLL MWH Attributes	Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development				Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle				
(17-821) Sugartree Fork																																				
Year: 1994																																				
12.2	60.5	6.02	■	■	■	■	■	■	■	■	■	5	■	■	■	■	■	■	■	■	■	■	■	■	0	●	●	■	■	■	■	■	■	5	0.17	1.00
Year: 1992																																				
14.7	77.5	20.00	■	■	■	■	■	■	■	■	■	8	■	■	■	■	■	■	■	■	■	■	■	■	0	■	■	■	■	■	■	■	■	2	0.11	0.33
14.7	77.5	20.00	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	■	■	■	■	■	■	0	■	■	■	■	■	■	■	■	0	0.10	0.10
14.1	44.5	20.00	■	■	■	■	■	■	■	■	■	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	3	●	●	●	●	●	●	●	●	5	1.00	2.25
13.0	41.5	14.18	■	■	■	■	■	■	■	■	■	4	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	4	●	●	●	●	●	●	●	●	5	1.00	2.00
12.2	78.5	6.02	■	■	■	■	■	■	■	■	■	7	■	■	■	■	■	■	■	■	■	■	■	■	0	●	●	■	■	■	■	■	■	3	0.13	0.50
11.1	66.5	6.02	■	■	■	■	■	■	■	■	■	6	■	■	■	■	■	■	■	■	■	■	■	■	0	●	●	■	■	■	■	■	■	4	0.14	0.71
(17-825) Turkey Run																																				
Year: 1998																																				
0.6	91.5	27.03	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	■	■	■	■	■	■	0	■	■	■	■	■	■	■	■	1	0.10	0.20
0.4	34.5	27.03	■	■	■	■	■	■	■	■	■	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	4	●	●	●	●	●	●	●	●	3	1.25	2.00
Year: 1994																																				
0.6	60.5	27.03	■	■	■	■	■	■	■	■	■	5	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	2	●	●	●	●	●	●	●	●	4	0.50	1.17
Year: 1992																																				
1.1	76.0	32.79	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	■	■	■	■	■	■	0	■	■	■	■	■	■	■	■	0	0.10	0.10
0.6	71.0	27.03	■	■	■	■	■	■	■	■	■	9	■	■	■	■	■	■	■	■	■	■	■	■	0	●	●	■	■	■	■	■	■	1	0.10	0.20
0.4	21.5	27.03	■	■	■	■	■	■	■	■	■	0	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	5	●	●	●	●	●	●	●	●	8	6.00	*. **

Table 3. Index of Biotic Integrity (IBI) metrics and scores for fish sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

IBI metrics and scores for sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI	
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omnivores	Pioneering fishes	Insectivores	DELT anomalies			
<i>Craborchard Creek - (17-359)</i>																	
Year: 2006																	
1.90	E	08/22/2006	9.6	22(5)	7(5)	3(3)	3(3)	4(5)	6(5)	73(1)	51(1)	61(1)	34(3)	0.0(5)	698(3)	40	
0.70	E	08/22/2006	11.4	19(5)	7(5)	2(3)	5(3)	5(5)	7(5)	62(1)	44(1)	69(1)	47(5)	0.0(5)	398(3)	42	
Year: 1998																	
1.90	E	09/04/1998	9.5	25(5)	8(5)	2(3)	3(3)	4(5)	6(5)	52(3)	37(1)	50(3)	55(5)	0.2(3)	1454(5)	46	
1.90	E	10/14/1998	9.5	23(5)	7(5)	2(3)	2(1)	3(3)	4(3)	60(1)	24(3)	54(3)	63(5)	0.0(5)	486(3)	40	
1.50	E	10/15/1998	10.3	24(5)	9(5)	2(3)	2(1)	3(3)	6(5)	66(1)	35(1)	61(1)	36(3)	0.0(5)	878(5)	38	
0.90	E	09/04/1998	10.9	22(5)	10(5)	1(1)	4(3)	5(5)	8(5)	33(5)	25(3)	54(3)	59(5)	0.0(5)	1823(5)	50	
0.90	E	10/14/1998	10.9	17(5)	6(3)	1(1)	4(3)	5(5)	7(5)	24(5)	17(3)	41(3)	66(5)	0.0(5)	1016(5)	48	
0.70	E	09/04/1998	11.2	22(5)	8(5)	1(1)	4(3)	4(3)	6(3)	48(3)	35(1)	71(1)	51(5)	0.0(5)	950(5)	40	
0.70	E	10/14/1998	11.2	22(5)	8(5)	1(1)	4(3)	4(3)	7(5)	54(3)	42(1)	82(1)	45(5)	0.0(5)	708(3)	40	
Year: 1997																	
1.90	E	10/15/1997	9.5	25(5)	9(5)	2(3)	1(1)	3(3)	5(3)	64(1)	39(1)	46(3)	48(5)	0.0(5)	383(3)	38	
0.90	E	10/15/1997	10.9	16(5)	5(3)	2(3)	3(3)	3(3)	6(3)	47(3)	31(1)	57(1)	54(5)	0.0(5)	662(3)	38	
0.70	E	10/15/1997	11.2	20(5)	7(5)	2(3)	3(3)	4(3)	7(5)	63(1)	49(1)	78(1)	41(3)	0.0(5)	614(3)	38	
Year: 1993																	
1.90	D	09/09/1993	9.5	16(5)	5(3)	2(3)	1(1)	4(5)	4(3)	69(1)	36(1)	69(1)	54(5)	0.5(3)	239(3)	34	
0.90	E	09/10/1993	10.9	17(5)	7(5)	3(3)	2(1)	4(3)	6(3)	44(3)	33(1)	51(3)	47(5)	0.0(5)	596(3)	40	
0.70	E	09/09/1993	11.2	12(3)	4(3)	1(1)	2(1)	3(3)	4(3)	47(3)	32(1)	92(1)	62(5)	0.0(5)	380(3)	32	
Year: 1992																	
3.50	E	08/04/1992	6.3	13(5)	5(3)	0(1)	0(1)	2(3)	3(3)	71(1)	47(1)	71(1)	35(3)	0.0(5)	318(3)	30	
3.50	D	09/22/1992	6.3	12(3)	6(5)	0(1)	0(1)	2(3)	3(3)	62(1)	44(1)	51(3)	40(5)	0.0(5)	284(3)	34	
1.90	D	04/09/1992	9.5	13(3)	5(3)	1(1)	0(1)	3(3)	3(3)	64(1)	38(1)	73(1)	32(3)	0.0(5)	448(3)	28	
1.90	E	08/04/1992	9.5	15(5)	4(3)	2(3)	0(1)	3(3)	3(3)	56(3)	22(3)	60(1)	54(5)	0.3(3)	220(3)	36	
1.90	D	09/22/1992	9.5	12(3)	4(3)	1(1)	0(1)	3(3)	3(3)	53(3)	16(3)	47(3)	47(5)	0.5(3)	158(1)	32	

◆ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

IBI metrics and scores for sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omnivores	Pioneering fishes	Insectivores	DELT anomalies		
0.90	E	08/06/1992	10.9	20(5)	8(5)	2(3)	4(3)	5(5)	7(5)	47(3)	39(1)	57(1)	37(3)	0.5(3)	293(3)	40
0.90	E	09/28/1992	10.9	17(5)	6(3)	1(1)	3(3)	5(5)	6(3)	52(3)	49(1)	60(1)	42(3)	0.0(5)	717(3)	36
0.70	E	08/05/1992	11.2	15(5)	6(3)	1(1)	3(3)	4(3)	5(3)	67(1)	47(1)	87(1)	43(3)	0.0(5)	129(1)	30
0.70	E	09/28/1992	11.2	17(5)	7(5)	1(1)	3(3)	4(3)	6(3)	39(3)	27(3)	84(1)	67(5)	0.2(3)	494(3)	38
<i>Sugartree Fork - (17-821)</i>																
Year: 2006																
14.70	E	08/21/2006	5.0	18(5)	6(5)	2(3)	4(3)	4(5)	7(5)	45(3)	26(1)	47(3)	47(5)	0.0(5)	614(5)	48
13.40	E	08/21/2006	10.7	22(5)	7(5)	3(3)	4(3)	4(5)	7(5)	63(1)	60(1)	65(1)	32(3)	0.0(5)	425(3)	40
Year: 1998																
14.70	E	09/04/1998	5.0	19(5)	8(5)	4(5)	4(3)	4(5)	8(5)	46(3)	13(5)	40(3)	43(5)	0.0(5)	926(5)	54
14.70	E	10/15/1998	5.0	21(5)	8(5)	3(3)	4(3)	4(5)	8(5)	68(1)	29(1)	63(1)	27(3)	0.8(3)	734(5)	40
14.10	E	09/04/1998	5.3	20(5)	8(5)	2(3)	3(3)	4(5)	6(5)	49(3)	30(1)	58(1)	58(5)	0.0(5)	414(3)	44
14.10	E	10/15/1998	5.3	21(5)	7(5)	3(3)	3(3)	4(5)	6(5)	60(1)	31(1)	65(1)	47(5)	0.2(5)	315(3)	42
12.90	E	09/04/1998	14.0	20(5)	6(3)	2(3)	4(3)	4(3)	7(5)	64(1)	40(1)	66(1)	36(3)	0.0(5)	452(3)	36
12.90	E	10/16/1998	14.0	15(3)	6(3)	2(3)	3(3)	3(3)	6(3)	64(1)	38(1)	72(1)	35(3)	0.0(5)	453(3)	32
12.20	E	09/04/1998	18.1	21(5)	6(3)	2(3)	4(3)	4(3)	7(5)	56(1)	32(3)	56(1)	49(5)	0.9(3)	426(3)	38
Year: 1994																
12.20	D	08/04/1994	18.1	22(5)	6(3)	2(3)	5(3)	4(3)	8(5)	53(1)	36(1)	80(1)	48(3)	0.0(5)	1606(5)	38
Year: 1993																
14.70	D	09/08/1993	5.0	21(5)	9(5)	5(5)	4(3)	4(5)	8(5)	70(1)	62(1)	69(1)	27(3)	0.0(5)	747(5)	44
14.10	D	09/08/1993	5.3	19(5)	7(5)	3(3)	3(3)	3(3)	7(5)	59(1)	51(1)	80(1)	42(5)	0.0(5)	905(5)	42
12.90	D	09/08/1993	14.0	17(5)	7(5)	2(3)	4(3)	4(3)	7(5)	66(1)	59(1)	81(1)	34(3)	0.0(5)	609(3)	38
12.20	D	09/09/1993	18.1	21(5)	7(5)	2(3)	5(3)	4(3)	8(5)	67(1)	35(1)	65(1)	35(3)	1.1(3)	389(3)	36
11.10	D	09/09/1993	19.8	16(3)	5(3)	1(1)	3(1)	3(3)	5(3)	45(3)	25(3)	35(3)	52(5)	3.8(1)	146(1)	30
Year: 1992																
14.70	D	04/09/1992	5.0	15(5)	6(5)	2(3)	2(1)	2(3)	5(5)	63(1)	41(1)	61(1)	41(5)	0.0(5)	510(5)	40

◆ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

IBI metrics and scores for sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

River Mile	Type	Date	Drainage area (sq mi)	Number of						Percent of Individuals					Rel.No. minus tolerants /(0.3km)	IBI
				Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies		
14.70	D	07/30/1992	5.0	15(5)	7(5)	2(3)	2(1)	3(3)	5(5)	72(1)	57(1)	73(1)	26(3)	0.2(3)	533(5)	36
14.70	D	08/04/1992	5.0	18(5)	6(5)	3(3)	3(3)	4(5)	6(5)	65(1)	44(1)	69(1)	35(3)	0.0(5)	521(5)	42
14.10	D	08/04/1992	5.3	18(5)	5(3)	2(3)	3(3)	4(5)	6(5)	56(3)	59(1)	68(1)	37(5)	0.1(5)	545(5)	44
14.10	D	09/29/1992	5.3	19(5)	6(5)	2(3)	3(3)	4(5)	6(5)	74(1)	64(1)	88(1)	33(3)	0.1(5)	285(3)	40
13.00	D	08/04/1992	14.0	16(5)	5(3)	1(1)	3(3)	3(3)	5(3)	67(1)	56(1)	73(1)	36(3)	0.7(3)	330(3)	30
13.00	D	09/29/1992	14.0	18(5)	7(5)	2(3)	3(3)	4(3)	6(3)	77(1)	72(1)	86(1)	24(3)	0.0(5)	614(3)	36
12.20	D	08/03/1992	18.1	20(5)	6(3)	2(3)	4(3)	4(3)	7(5)	55(1)	36(1)	49(3)	48(3)	1.7(1)	242(3)	34
12.20	D	09/25/1992	18.1	16(3)	6(3)	2(3)	3(1)	4(3)	6(3)	64(1)	44(1)	62(1)	40(3)	2.0(1)	260(3)	26
11.10	D	08/03/1992	19.8	17(5)	5(3)	1(1)	4(3)	3(3)	6(3)	50(3)	20(3)	41(3)	62(5)	0.6(5)	163(1)	38
11.10	D	09/25/1992	19.8	19(5)	6(3)	2(3)	4(3)	4(3)	7(3)	52(3)	19(3)	56(1)	48(3)	1.2(3)	146(1)	34
<i>Turkey Run - (17-825)</i>																
Year: 2006																
0.40	E	08/21/2006	2.8	21(5)	8(5)	6(5)	3(3)	4(5)	7(5)	81(1)	70(1)	78(1)	12(1)	0.0(5)	846(5)	42
Year: 1998																
0.60	E	10/16/1998	2.4	20(5)	8(5)	6(5)	5(5)	5(5)	9(5)	70(1)	48(1)	69(1)	23(3)	0.0(5)	1898(5)	46
0.40	E	10/15/1998	2.8	13(5)	7(5)	4(5)	1(1)	3(5)	5(5)	82(1)	57(1)	79(1)	14(1)	0.0(5)	930(5)	40
Year: 1994																
0.60	E	08/04/1994	2.4	13(5)	8(5)	4(5)	1(1)	2(3)	5(5)	61(1)	26(1)	65(1)	33(5)	0.0(5)	972(5)	42
Year: 1993																
0.60	D	09/07/1993	2.4	13(5)	8(5)	4(5)	1(1)	2(3)	5(5)	54(3)	25(1)	56(1)	45(5)	0.0(5)	1284(5)	44
0.40	D	09/08/1993	2.8	11(5)	7(5)	4(5)	1(1)	2(3)	5(5)	85(1)	34(1)	89(1)	21(3)	0.0(5)	400(5)	40
Year: 1992																
0.60	E	07/29/1992	2.4	14(5)	8(5)	4(5)	1(1)	2(3)	5(5)	77(1)	18(3)	68(1)	28(3)	0.4(3)	164(3)	38
0.60	E	09/29/1992	2.4	16(5)	8(5)	4(5)	2(3)	2(3)	6(5)	67(1)	7(5)	60(1)	34(5)	0.0(5)	504(5)	48
0.40	E	07/29/1992	2.8	14(5)	6(5)	3(3)	0(1)	2(3)	4(5)	46(3)	32(1)	88(1)	54(5)	0.0(5)	2591(5)	42
0.40	E	09/29/1992	2.8	10(5)	5(5)	2(3)	0(1)	2(3)	3(3)	43(3)	29(1)	88(1)	57(5)	0.1(5)	1800(5)	40

◆ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Table 4. Fish community sampling results for stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 2006.

Species List

River Code: 17-359	Stream: Craborchard Creek	Sample Date: 2006
River Mile: 1.90	Location:	Date Range: 08/22/2006
Time Fished: 2667 sec	Drainage: 9.6 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N		3	4.50	0.17			
Redfin Pickerel		P	M	P	1	1.50	0.06			
Golden Redhorse	R	I	S	M	44	66.00	2.53			
White Sucker	W	O	S	T	200	300.00	11.52			
Creek Chub	N	G	N	T	244	366.00	14.06			
Redside Dace	N	I	S	I	1	1.50	0.06			
Redfin Shiner	N	I	N		138	207.00	7.95			
Striped Shiner	N	I	S		143	214.50	8.24			
Fathead Minnow	N	O	C	T	1	1.50	0.06			
Bluntnose Minnow	N	O	C	T	680	1,020.00	39.17			
Central Stoneroller	N	H	N		4	6.00	0.23			
Brown Bullhead		I	C	T	38	57.00	2.19			
Trout-perch		I	M		22	33.00	1.27			
Rock Bass	S	C	C		10	15.00	0.58			
Warmouth Sunfish	S	C	C		2	3.00	0.12			
Green Sunfish	S	I	C	T	108	162.00	6.22			
Bluegill Sunfish	S	I	C	P	12	18.00	0.69			
Redear Sunfish	E	I	C		1	1.50	0.06			
Pumpkinseed Sunfish	S	I	C	P	3	4.50	0.17			
Blackside Darter	D	I	S		34	51.00	1.96			
Johnny Darter	D	I	C		31	46.50	1.79			
Greenside Darter	D	I	S	M	8	12.00	0.46			
Fantail Darter	D	I	C		8	12.00	0.46			
	<i>Mile Total</i>				1,736	2,604.00				
	<i>Number of Species</i>				23					
	<i>Number of Hybrids</i>				0					

Species List

River Code: 17-359	Stream: Craborchard Creek	Sample Date: 2006
River Mile: 0.70	Location:	Date Range: 08/22/2006
Time Fished: 2670 sec	Drainage: 11.4 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N		2	3.00	0.29			
Redfin Pickerel		P	M	P	9	13.50	1.28			
Golden Redhorse	R	I	S	M	12	18.00	1.71			
Northern Hog Sucker	R	I	S	M	2	3.00	0.29			
White Sucker	W	O	S	T	3	4.50	0.43			
Creek Chub	N	G	N	T	50	75.00	7.13			
Redfin Shiner	N	I	N		83	124.50	11.84			
Striped Shiner	N	I	S		17	25.50	2.43			
Sand Shiner	N	I	M	M	10	15.00	1.43			
Silverjaw Minnow	N	I	M		29	43.50	4.14			
Bluntnose Minnow	N	O	C	T	303	454.50	43.22			
Central Stoneroller	N	H	N		3	4.50	0.43			
Rock Bass	S	C	C		4	6.00	0.57			
Green Sunfish	S	I	C	T	80	120.00	11.41			
Blackside Darter	D	I	S		7	10.50	1.00			
Johnny Darter	D	I	C		24	36.00	3.42			
Greenside Darter	D	I	S	M	38	57.00	5.42			
Banded Darter	D	I	S	I	2	3.00	0.29			
Fantail Darter	D	I	C		23	34.50	3.28			
<i>Mile Total</i>					701	1,051.50				
<i>Number of Species</i>					19					
<i>Number of Hybrids</i>					0					

Species List

River Code: 17-821	Stream: Sugartree Fork	Sample Date: 2006
River Mile: 14.70	Location:	Date Range: 08/21/2006
Time Fished: 3840 sec	Drainage: 5.0 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I	S	M	3	4.50	0.40			
Northern Hog Sucker	R	I	S	M	15	22.50	2.01			
White Sucker	W	O	S	T	22	33.00	2.95			
Western Blacknose Dace	N	G	S	T	7	10.50	0.94			
Creek Chub	N	G	N	T	124	186.00	16.62			
Striped Shiner	N	I	S		105	157.50	14.08			
Silverjaw Minnow	N	I	M		31	46.50	4.16			
Bluntnose Minnow	N	O	C	T	172	258.00	23.06			
Central Stoneroller	N	H	N		39	58.50	5.23			
White Crappie	S	I	C		7	10.50	0.94			
Rock Bass	S	C	C		11	16.50	1.47			
Largemouth Bass	F	C	C		20	30.00	2.68			
Green Sunfish	S	I	C	T	12	18.00	1.61			
Bluegill Sunfish	S	I	C	P	27	40.50	3.62			
Redear Sunfish	E	I	C		1	1.50	0.13			
Green Sf X Bluegill Sf					2	3.00	0.27			
Logperch	D	I	S	M	4	6.00	0.54			
Johnny Darter	D	I	C		14	21.00	1.88			
Greenside Darter	D	I	S	M	7	10.50	0.94			
Fantail Darter	D	I	C		123	184.50	16.49			
<i>Mile Total</i>					746	1,119.00				
<i>Number of Species</i>					19					
<i>Number of Hybrids</i>					1					

Species List

River Code: 17-821	Stream: Sugartree Fork	Sample Date: 2006
River Mile: 13.40	Location:	Date Range: 08/21/2006
Time Fished: 2850 sec	Drainage: 10.7 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N		2	3.00	0.26			
Golden Redhorse	R	I	S	M	26	39.00	3.36			
Northern Hog Sucker	R	I	S	M	12	18.00	1.55			
White Sucker	W	O	S	T	12	18.00	1.55			
Common Carp	G	O	M	T	3	4.50	0.39			
Western Blacknose Dace	N	G	S	T	3	4.50	0.39			
Creek Chub	N	G	N	T	14	21.00	1.81			
Striped Shiner	N	I	S		3	4.50	0.39			
Spotfin Shiner	N	I	M		3	4.50	0.39			
Silverjaw Minnow	N	I	M		20	30.00	2.59			
Bluntnose Minnow	N	O	C	T	447	670.50	57.83			
Central Stoneroller	N	H	N		20	30.00	2.59			
Channel Catfish	F		C		10	15.00	1.29			
White Crappie	S	I	C		9	13.50	1.16			
Rock Bass	S	C	C		10	15.00	1.29			
Largemouth Bass	F	C	C		5	7.50	0.65			
Green Sunfish	S	I	C	T	11	16.50	1.42			
Bluegill Sunfish	S	I	C	P	41	61.50	5.30			
Redear Sunfish	E	I	C		1	1.50	0.13			
Pumpkinseed Sunfish	S	I	C	P	6	9.00	0.78			
Bluegill X Pumpkinseed					2	3.00	0.26			
Logperch	D	I	S	M	12	18.00	1.55			
Johnny Darter	D	I	C		10	15.00	1.29			
Greenside Darter	D	I	S	M	18	27.00	2.33			
Fantail Darter	D	I	C		73	109.50	9.44			
<i>Mile Total</i>					773	1,159.50				
<i>Number of Species</i>					24					
<i>Number of Hybrids</i>					1					

Species List

River Code: 17-825	Stream: Turkey Run	Sample Date: 2006
River Mile: 0.40	Location:	Date Range: 08/21/2006
Time Fished: 3660 sec	Drainage: 2.8 sq mi	
Dist Fished: 0.20 km	Basin: Muskingum River	No of Passes: 1
		Sampler Type: E

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F	N		1	1.50	0.03			
Golden Redhorse	R	I	S	M	3	4.50	0.10			
White Sucker	W	O	S	T	27	40.50	0.89			
Western Blacknose Dace	N	G	S	T	137	205.50	4.54			
Creek Chub	N	G	N	T	188	282.00	6.23			
South. Redbelly Dace	N	H	S		7	10.50	0.23			
Redside Dace	N	I	S	I	4	6.00	0.13			
Striped Shiner	N	I	S		195	292.50	6.46			
Silverjaw Minnow	N	I	M		23	34.50	0.76			
Bluntnose Minnow	N	O	C	T	2,075	3,112.50	68.73			
Central Stoneroller	N	H	N		193	289.50	6.39			
White Crappie	S	I	C		1	1.50	0.03			
Rock Bass	S	C	C		1	1.50	0.03			
Spotted Bass	F	C	C		1	1.50	0.03			
Largemouth Bass	F	C	C		17	25.50	0.56			
Green Sunfish	S	I	C	T	28	42.00	0.93			
Bluegill Sunfish	S	I	C	P	9	13.50	0.30			
Green Sf X Bluegill Sf					1	1.50	0.03			
Johnny Darter	D	I	C		26	39.00	0.86			
Greenside Darter	D	I	S	M	36	54.00	1.19			
Fantail Darter	D	I	C		45	67.50	1.49			
Mottled Sculpin		I	C		1	1.50	0.03			
<i>Mile Total</i>					3,019	4,528.50				
<i>Number of Species</i>					21					
<i>Number of Hybrids</i>					1					

Table 5. Invertebrate Community Index (ICI) metrics and scores for macroinvertebrate sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

ICI metrics and scores for sampling stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 1992-2006.

River Mile	Drainage Area (sq mi)	Number of				Percent:					Qual. EPT	Eco-region	ICI
		Total Taxa	Mayfly Taxa	Caddisfly Taxa	Dipteran Taxa	Mayflies	Caddisflies	Tanytarsini	Other Dipt/NI	Tolerant Organisms			
Craborchard Creek (17-359)													
Year: 2006													
3.50	5.7	55(6)	10(6)	3(6)	27(6)	10.7(2)	5.5(6)	27.7(6)	53.9(2)	13.8(4)	22(6)	4	50
0.70	11.4	50(6)	8(6)	3(6)	26(6)	36.9(6)	1.2(4)	22.0(6)	38.6(4)	7.4(6)	24(6)	4	56
Year: 1998													
3.50	6.3	45(6)	7(6)	5(6)	20(6)	13.5(4)	1.2(6)	47.0(6)	37.2(4)	8.0(6)	13(6)	4	56
0.70 A	11.4	45(6)	8(6)	1(2)	23(6)	22.7(4)	0.2(2)	16.4(4)	60.2(2)	10.1(4)	19(6)	4	42
0.70 B	11.4	49(6)	9(6)	4(6)	24(6)	39.9(6)	2.9(6)	17.5(4)	37.9(4)	4.2(6)	19(6)	4	56
Year: 1992													
3.50	6.3	54(6)	9(6)	4(6)	27(6)	16.3(4)	3.4(6)	27.1(6)	52.4(2)	33.5(0)	5(2)	4	44
1.80	9.5	46(6)	6(4)	3(6)	25(6)	4.6(2)	4.2(6)	38.7(6)	51.8(2)	28.3(0)	6(2)	4	40
0.90	10.9	49(6)	7(6)	6(6)	27(6)	3.4(2)	7.8(6)	33.7(6)	54.7(2)	11.5(4)	7(4)	4	48
0.30 A	11.4	51(6)	11(6)	7(6)	21(6)	6.8(2)	17.9(6)	51.3(6)	22.6(6)	2.5(6)	7(4)	4	54
0.30 B	11.4	50(6)	7(6)	5(6)	26(6)	4.1(2)	20.3(6)	29.8(6)	40.6(4)	8.0(6)	7(4)	4	52
Sugartree Fork (17-821)													
Year: 2006													
14.70	5.0	40(6)	8(6)	3(6)	24(6)	29.8(6)	6.9(6)	17.7(4)	38.3(4)	0.0(6)	21(6)	4	56
13.40	10.7	57(6)	8(6)	8(6)	26(6)	18.5(4)	11.7(6)	18.0(4)	46.7(2)	4.2(6)	22(6)	4	52
Year: 1998													
14.70	5.0	55(6)	7(6)	9(6)	28(6)	10.4(2)	3.2(6)	10.6(4)	75.1(0)	3.1(6)	31(6)	4	48
13.40 A	10.7	57(6)	11(6)	10(6)	23(6)	29.5(6)	7.6(6)	15.5(4)	46.4(2)	3.9(6)	21(6)	4	54
13.40 B	10.7	54(6)	9(6)	8(6)	25(6)	27.8(6)	3.0(6)	11.0(4)	57.7(2)	7.6(6)	21(6)	4	54
Year: 1992													
14.70	5.0	41(6)	10(6)	3(6)	20(6)	14.1(4)	1.8(6)	52.8(6)	28.4(6)	5.7(6)	17(6)	4	58
14.10	5.3	40(6)	8(6)	3(6)	21(6)	9.5(2)	2.5(6)	45.7(6)	40.9(4)	9.2(4)	14(6)	4	52
13.40	10.7	38(6)	9(6)	4(6)	18(4)	20.9(4)	7.2(6)	47.5(6)	22.6(6)	6.7(6)	15(6)	4	56
12.20	18.1	43(6)	7(6)	6(6)	19(4)	11.1(2)	18.9(6)	44.3(6)	21.9(6)	3.0(6)	18(6)	4	54
11.10	19.8	39(6)	5(4)	5(6)	23(6)	4.6(2)	24.7(6)	26.5(6)	37.8(4)	11.0(4)	13(6)	4	50
Turkey Run (17-825)													
Year: 2006													
0.40	2.8	48(6)	8(6)	4(6)	28(6)	8.8(2)	3.6(6)	39.5(6)	47.7(2)	6.5(6)	25(6)	4	52
Year: 1992													
0.90	2.3	44(6)	10(6)	5(6)	21(6)	41.9(6)	1.1(6)	40.0(6)	16.9(6)	6.0(6)	15(6)	4	60
0.40 A	2.8	42(6)	7(6)	7(6)	24(6)	9.7(2)	3.6(6)	33.5(6)	53.2(2)	10.7(4)	13(6)	4	50
0.40 B	2.8	41(6)	9(6)	5(6)	22(6)	11.5(4)	1.2(6)	38.4(6)	48.7(2)	5.7(6)	13(6)	4	54

Table 6. Macroinvertebrate community sampling results for stations in Craborchard Creek, Sugartree Fork, and Turkey Run, 2006.

Ohio EPA/DSW Ecological Assessment Section
 Macroinvertebrate Collection

Site: Craborchard Creek

Collection Date: 09/22/2006 River Code: 17-359 RM: 3.50

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01801	<i>Turbellaria</i>	1	67300	<i>Hydrochus sp</i>	+
03360	<i>Plumatella sp</i>	+	67800	<i>Tropisternus sp</i>	+
03600	<i>Oligochaeta</i>	12	68130	<i>Helichus sp</i>	6
04685	<i>Placobdella ornata</i>	1	68700	<i>Dubiraphia sp</i>	9
06201	<i>Hyaella azteca</i>	+	68901	<i>Macronychus glabratus</i>	1
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	69400	<i>Stenelmis sp</i>	56
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	71100	<i>Hexatoma sp</i>	+
08601	<i>Hydrachnidia</i>	1	71700	<i>Pilaria sp</i>	+
11018	<i>Acerpenna macdunnoughi</i>	18	71900	<i>Tipula sp</i>	+
11120	<i>Baetis flavistriga</i>	5	71910	<i>Tipula abdominalis</i>	1
11130	<i>Baetis intercalaris</i>	3	72340	<i>Dixella sp</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	74501	<i>Ceratopogonidae</i>	8
11430	<i>Dipheter hageni</i>	6	77120	<i>Ablabesmyia mallochi</i>	+
12200	<i>Isonychia sp</i>	+	77500	<i>Conchapelopia sp</i>	40
13400	<i>Stenacron sp</i>	+	77750	<i>Hayesomyia senata or Thienemannimyia norena</i>	40
13521	<i>Stenonema femoratum</i>	8	77800	<i>Helopelopia sp</i>	118
13590	<i>Maccaffertium vicarium</i>	17	78350	<i>Meropelopia sp</i>	40
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	326	78401	<i>Natarsia species A (sensu Roback, 1978)</i>	24
16200	<i>Eurylophella sp</i>	1	78655	<i>Procladius (Holotanypus) sp</i>	+
17200	<i>Caenis sp</i>	8	80370	<i>Corynoneura lobata</i>	223
17600	<i>Baetisca sp</i>	1	80410	<i>Cricotopus (C.) sp</i>	+
18600	<i>Ephemera sp</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	353
21200	<i>Calopteryx sp</i>	+	80430	<i>Cricotopus (C.) tremulus group</i>	165
22001	<i>Coenagrionidae</i>	+	81270	<i>Nanocladius (N.) spiniplenus</i>	24
22300	<i>Argia sp</i>	+	81465	<i>Orthocladius (O.) carlatus</i>	118
23804	<i>Basiaeschna janata</i>	+	81630	<i>Parakiefferiella sp</i>	+
23909	<i>Boyeria vinosa</i>	2	81650	<i>Parametriocnemus sp</i>	448
24900	<i>Gomphus sp</i>	+	82121	<i>Thienemanniella lobapodema</i>	16
25510	<i>Stylogomphus albistylus</i>	+	82141	<i>Thienemanniella xena</i>	24
33100	<i>Leuctra sp</i>	+	82820	<i>Cryptochironomus sp</i>	24
34130	<i>Acroneuria frisoni</i>	6	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	47
42700	<i>Belostoma sp</i>	+	84100	<i>Paracladopelma sp</i>	+
47600	<i>Sialis sp</i>	+	84210	<i>Paratendipes albimanus or P. duplicatus</i>	24
51400	<i>Nyctiophylax sp</i>	+	84315	<i>Phaenopsectra flavipes</i>	+
51600	<i>Polycentropus sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	24
52200	<i>Cheumatopsyche sp</i>	192	85500	<i>Paratanytarsus sp</i>	141
52430	<i>Ceratopsyche morosa group</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	94
52530	<i>Hydropsyche depravata group</i>	+	85625	<i>Rheotanytarsus sp</i>	71
53501	<i>Hydroptilidae</i>	1	85800	<i>Tanytarsus sp</i>	353
57900	<i>Pycnopsyche sp</i>	8	85802	<i>Tanytarsus curticornis</i>	236
58505	<i>Helicopsyche borealis</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	47
60900	<i>Peltodytes sp</i>	+	85840	<i>Tanytarsus sepp</i>	71
63300	<i>Hydroporus sp</i>	+	87540	<i>Hemerodromia sp</i>	48
63700	<i>Ilybius sp</i>	+			

**Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection**

Site: Craborchard Creek

Collection Date: 09/22/2006 River Code: 17-359 RM: 3.50

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
89001	<i>Sciomyzidae</i>	+			
94400	<i>Fossaria sp</i>	1			
95100	<i>Physella sp</i>	14 +			
96002	<i>Helisoma anceps anceps</i>	1 +			
96900	<i>Ferrissia sp</i>	126 +			
98600	<i>Sphaerium sp</i>	3 +			

No. Quantitative Taxa: 55 Total Taxa: 93

No. Qualitative Taxa: 69 ICI: **50**

Number of Organisms: 3656 Qual EPT: 22

Ohio EPA/DSW Ecological Assessment Section
 Macroinvertebrate Collection

Site: Craborchard Creek

Collection Date: 09/22/2006 River Code: 17-359 RM: 0.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
01320	<i>Hydra sp</i>	9	71900	<i>Tipula sp</i>	+
01801	<i>Turbellaria</i>	1 +	72700	<i>Anopheles sp</i>	+
03600	<i>Oligochaeta</i>	16 +	74100	<i>Simulium sp</i>	+
06201	<i>Hyalella azteca</i>	+	77120	<i>Ablabesmyia mallochi</i>	14 +
08260	<i>Orconectes (Crokerinus) sanbornii sanbornii</i>	+	77800	<i>Helopelopia sp</i>	84 +
08601	<i>Hydrachnidia</i>	1 +	78140	<i>Labrundinia pilosella</i>	8
11018	<i>Acerpenna macdunnoughi</i>	+	78402	<i>Natarsia baltimoreus</i>	+
11120	<i>Baetis flavistriga</i>	+	78450	<i>Nilotanytus fimbriatus</i>	7
11130	<i>Baetis intercalaris</i>	+	78500	<i>Paramerina fragilis</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	80370	<i>Corynoneura lobata</i>	163 +
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	80420	<i>Cricotopus (C.) bicinctus</i>	98 +
11651	<i>Procloeon sp (w/o hindwing pads)</i>	5 +	80430	<i>Cricotopus (C.) tremulus group</i>	126
11670	<i>Procloeon viridoculare</i>	+	81270	<i>Nanocladius (N.) spinipennis</i>	14
12200	<i>Isonychia sp</i>	+	81465	<i>Orthocladius (O.) carlatus</i>	56 +
13400	<i>Stenacron sp</i>	14 +	81632	<i>Parakiefferiella n.sp 2</i>	14
13521	<i>Stenonema femoratum</i>	3 +	81650	<i>Parametriocnemus sp</i>	14 +
13590	<i>Maccaffertium vicarium</i>	129 +	81690	<i>Paratrichocladius sp</i>	28
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	594 +	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	14
16200	<i>Eurylophella sp</i>	1	82101	<i>Thienemanniella taurocapita</i>	3
16700	<i>Tricorythodes sp</i>	5	82121	<i>Thienemanniella lobapodema</i>	39
17200	<i>Caenis sp</i>	8 +	82820	<i>Cryptochironomus sp</i>	+
17600	<i>Baetisca sp</i>	+	83040	<i>Dicrotendipes neomodestus</i>	14
21200	<i>Calopteryx sp</i>	10 +	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	+
22001	<i>Coenagrionidae</i>	+	84118	<i>Paracladopelma undine</i>	+
22300	<i>Argia sp</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	+
23909	<i>Boyeria vinosa</i>	1 +	84460	<i>Polypedilum (P.) fallax group</i>	28
34130	<i>Acroneuria frisoni</i>	1 +	84470	<i>Polypedilum (P.) illinoense</i>	+
36500	<i>Sweltsa sp</i>	+	84475	<i>Polypedilum (P.) ophioides</i>	+
47600	<i>Sialis sp</i>	+	84960	<i>Pseudochironomus sp</i>	+
50315	<i>Chimarra obscura</i>	6 +	85230	<i>Cladotanytarsus mancus group</i>	+
50804	<i>Lype diversa</i>	1	85500	<i>Paratanytarsus sp</i>	28 +
51600	<i>Polycentropus sp</i>	+	85615	<i>Rheotanytarsus pellucidus</i>	70
52200	<i>Cheumatopsyche sp</i>	18 +	85625	<i>Rheotanytarsus sp</i>	56
52430	<i>Ceratopsyche morosa group</i>	+	85711	<i>Stempellinella leptocelloides</i>	4 +
52530	<i>Hydropsyche depravata group</i>	+	85800	<i>Tanytarsus sp</i>	42
53800	<i>Hydroptila sp</i>	+	85802	<i>Tanytarsus curticornis</i>	28
55300	<i>Ptilostomis sp</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	126
57900	<i>Pycnopsyche sp</i>	+	85840	<i>Tanytarsus sepp</i>	98 +
60900	<i>Peltodytes sp</i>	+	86100	<i>Chrysops sp</i>	+
68025	<i>Ectopria sp</i>	+	87540	<i>Hemerodromia sp</i>	12
68130	<i>Helichus sp</i>	1 +	93200	<i>Hydrobiidae</i>	22 +
68901	<i>Macronychus glabratus</i>	9 +	95100	<i>Physella sp</i>	1 +
69400	<i>Stenelmis sp</i>	4 +	96900	<i>Ferrissia sp</i>	9
71100	<i>Hexatoma sp</i>	+	98600	<i>Sphaerium sp</i>	+

**Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection**

Site: Craborchard Creek

Collection Date: 09/22/2006 River Code: 17-359 RM: 0.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
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No. Quantitative Taxa: 50 Total Taxa: 88

No. Qualitative Taxa: 66 ICI: **56**

Number of Organisms: 2057 Qual EPT: 24

Ohio EPA/DSW Ecological Assessment Section
 Macroinvertebrate Collection

Site: Sugartree Fork

Collection Date: 09/21/2006 River Code: 17-821 RM: 14.70

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+	81270	<i>Nanocladius (N.) spinipenus</i>	5
01801	<i>Turbellaria</i>	+	81465	<i>Orthocladius (O.) carlatus</i>	2
03600	<i>Oligochaeta</i>	+	81631	<i>Parakiefferiella n.sp 1</i>	+
06201	<i>Hyalella azteca</i>	+	81650	<i>Parametrioconemus sp</i>	52
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	7
11018	<i>Acerpenna macdunnoughi</i>	2	82141	<i>Thienemanniella xena</i>	8
11120	<i>Baetis flavistriga</i>	22 +	83300	<i>Glyptotendipes (G.) sp</i>	2
11125	<i>Pseudocloeon frondale</i>	+	83840	<i>Microtendipes pedellus group</i>	5
11130	<i>Baetis intercalaris</i>	16 +	84315	<i>Phaenopsectra flavipes</i>	+
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	84440	<i>Polypedilum (Uresipedilum) aviceps</i>	10
11430	<i>Dipheter hageni</i>	10	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	2
11670	<i>Procloeon viridoculare</i>	+	84700	<i>Stenochironomus sp</i>	+
12200	<i>Isonychia sp</i>	14 +	84790	<i>Tribelos fuscicorne</i>	+
13400	<i>Stenacron sp</i>	+	85261	<i>Cladotanytarsus vanderwulpi group Type 1</i>	2
13521	<i>Stenonema femoratum</i>	+	85500	<i>Paratanytarsus sp</i>	2
13590	<i>Maccaffertium vicarium</i>	78 +	85615	<i>Rheotanytarsus pellucidus</i>	10
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	2 +	85625	<i>Rheotanytarsus sp</i>	29
17200	<i>Caenis sp</i>	4 +	85720	<i>Stempellinella fimbriata</i>	7
18600	<i>Ephemera sp</i>	+	85800	<i>Tanytarsus sp</i>	2
21200	<i>Calopteryx sp</i>	+	85802	<i>Tanytarsus curticornis</i>	17
22001	<i>Coenagrionidae</i>	+	85821	<i>Tanytarsus glabrescens group sp 7</i>	12 +
25510	<i>Stylogomphus albistylus</i>	+	85840	<i>Tanytarsus sepp</i>	7
34130	<i>Acroneuria frisoni</i>	12 +	87200	<i>Odontomyia (O.) sp or Hedriodiscus sp</i>	+
50301	<i>Chimarra aterrima</i>	7 +	87540	<i>Hemerodromia sp</i>	8
50315	<i>Chimarra obscura</i>	3 +	95100	<i>Physella sp</i>	+
51400	<i>Nyctiophylax sp</i>	+	96900	<i>Ferrissia sp</i>	+
52200	<i>Cheumatopsyche sp</i>	24 +			
52430	<i>Ceratopsyche morosa group</i>	+	No. Quantitative Taxa: 40		Total Taxa: 70
52530	<i>Hydropsyche depravata group</i>	+	No. Qualitative Taxa: 47		ICI: 56
53501	<i>Hydroptilidae</i>	+	Number of Organisms: 496		Qual EPT: 21
58505	<i>Helicopsyche borealis</i>	+			
63300	<i>Hydroporus sp</i>	+			
68130	<i>Helichus sp</i>	7 +			
68708	<i>Dubiraphia vittata group</i>	6 +			
68901	<i>Macronychus glabratus</i>	10 +			
69400	<i>Stenelmis sp</i>	1 +			
71100	<i>Hexatoma sp</i>	+			
71900	<i>Tipula sp</i>	3 +			
72340	<i>Dixella sp</i>	+			
74100	<i>Simulium sp</i>	+			
77500	<i>Conchapelopia sp</i>	2			
77800	<i>Helopelopia sp</i>	50 +			
78450	<i>Nilotanypus fimbriatus</i>	2			
80370	<i>Corynoneura lobata</i>	32			

Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection

Site: Sugartree Fork

Collection Date: 09/21/2006 River Code: 17-821 RM: 13.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
00401	<i>Spongillidae</i>	+	71100	<i>Hexatoma sp</i>	+
01320	<i>Hydra sp</i>	1	71700	<i>Pilaria sp</i>	+
01801	<i>Turbellaria</i>	23	71900	<i>Tipula sp</i>	1
03600	<i>Oligochaeta</i>	50 +	71910	<i>Tipula abdominalis</i>	+
05800	<i>Caecidotea sp</i>	+	72340	<i>Dixella sp</i>	+
06201	<i>Hyalella azteca</i>	+	74100	<i>Simulium sp</i>	1 +
07701	<i>Cambaridae</i>	1	74501	<i>Ceratopogonidae</i>	8
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	74650	<i>Atrichopogon sp</i>	1
08601	<i>Hydrachnidia</i>	4 +	77001	<i>Tanypodinae</i>	7
11018	<i>Acerpenna macdunnoughi</i>	12 +	77120	<i>Ablabesmyia mallochi</i>	+
11120	<i>Baetis flavistriga</i>	24 +	77500	<i>Conchapelopia sp</i>	7
11130	<i>Baetis intercalaris</i>	59 +	77800	<i>Helopelopia sp</i>	83 +
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	78401	<i>Natarsia species A (sensu Roback, 1978)</i>	+
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	80351	<i>Corynoneura n.sp 1</i>	67
11670	<i>Procloeon viridoculare</i>	+	80360	<i>Corynoneura "celeripes" (sensu Simpson & Bode, 1980)</i>	23
12200	<i>Isonychia sp</i>	14 +	80370	<i>Corynoneura lobata</i>	83
13400	<i>Stenacron sp</i>	+	81231	<i>Nanocladius (N.) crassicornus or N. (N.) "rectinervis"</i>	35
13521	<i>Stenonema femoratum</i>	+	81270	<i>Nanocladius (N.) spiniplenus</i>	7
13590	<i>Maccaffertium vicarium</i>	135 +	81650	<i>Parametriocnemus sp</i>	42 +
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	33 +	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	14
15501	<i>Ephemerellidae</i>	1	82101	<i>Thienemanniella taurocapita</i>	35
17200	<i>Caenis sp</i>	37 +	82141	<i>Thienemanniella xena</i>	31
18600	<i>Ephemera sp</i>	+	83820	<i>Microtendipes "caelum" (sensu Simpson & Bode, 1980)</i>	+
22300	<i>Argia sp</i>	1	83840	<i>Microtendipes pedellus group</i>	7
25510	<i>Stylogomphus albistylus</i>	+	84450	<i>Polypedilum (Uresipedilum) flavum</i>	7
34130	<i>Acroneuria frisoni</i>	7 +	84540	<i>Polypedilum (Tripodura) scalaenum group</i>	7
47600	<i>Sialis sp</i>	+	84700	<i>Stenochironomus sp</i>	+
48410	<i>Corydalus cornutus</i>	+	84750	<i>Stictochironomus sp</i>	+
50301	<i>Chimarra aterrima</i>	5	84960	<i>Pseudochironomus sp</i>	+
50315	<i>Chimarra obscura</i>	90 +	85500	<i>Paratanytarsus sp</i>	+
51400	<i>Nyctiophylax sp</i>	+	85625	<i>Rheotanytarsus sp</i>	132 +
51600	<i>Polycentropus sp</i>	1 +	85720	<i>Stempellinella fimbriata</i>	7
52200	<i>Cheumatopsyche sp</i>	67 +	85800	<i>Tanytarsus sp</i>	69 +
52430	<i>Ceratopsyche morosa group</i>	15 +	85802	<i>Tanytarsus curticornis</i>	7
52530	<i>Hydropsyche depravata group</i>	7 +	85821	<i>Tanytarsus glabrescens group sp 7</i>	56
58505	<i>Helicopsyche borealis</i>	10 +	85840	<i>Tanytarsus sepp</i>	35
59120	<i>Ceraclea flava complex</i>	+	87400	<i>Stratiomys sp</i>	+
59500	<i>Oecetis sp</i>	5	87540	<i>Hemerodromia sp</i>	90
64050	<i>Liodessus sp</i>	+	96900	<i>Ferrissia sp</i>	21 +
68025	<i>Ectopria sp</i>	2 +	97601	<i>Corbicula fluminea</i>	138
68708	<i>Dubiraphia vittata group</i>	1 +	98200	<i>Pisidium sp</i>	1
68901	<i>Macronychus glabratus</i>	17			
69275	<i>Optioservus trivittatus</i>	9			
69400	<i>Stenelmis sp</i>	51 +			

**Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection**

Site: Sugartree Fork

Collection Date: 09/21/2006 River Code: 17-821 RM: 13.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
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No. Quantitative Taxa: 57 Total Taxa: 85

No. Qualitative Taxa: 53 ICI: **52**

Number of Organisms: 1704 Qual EPT: 22

**Ohio EPA/DSW Ecological Assessment Section
Macroinvertebrate Collection**

Site: Turkey Run

Collection Date: 09/21/2006 River Code: 17-825 RM: 0.40

Taxa Code	Taxa	Quant/Qual	Taxa Code	Taxa	Quant/Qual
03360	<i>Plumatella sp</i>	1 +	77800	<i>Helopelopia sp</i>	187 +
03600	<i>Oligochaeta</i>	80 +	79210	<i>Thienemannimyia norena</i>	31 +
06201	<i>Hyaella azteca</i>	+	79400	<i>Zavreliomyia sp</i>	+
07860	<i>Cambarus (Puncticambarus) robustus</i>	+	80351	<i>Corynoneura n.sp I</i>	32
08260	<i>Orconectes (Crockerinus) sanbornii sanbornii</i>	+	80370	<i>Corynoneura lobata</i>	280
08601	<i>Hydrachnidia</i>	8	80410	<i>Cricotopus (C.) sp</i>	156
11018	<i>Acerpenna macdunnoughi</i>	29 +	80420	<i>Cricotopus (C.) bicinctus</i>	94 +
11120	<i>Baetis flavistriga</i>	32 +	81270	<i>Nanocladius (N.) spiniplenus</i>	31 +
11125	<i>Pseudocloeon frondale</i>	+	81465	<i>Orthocladus (O.) carlatus</i>	62
11130	<i>Baetis intercalaris</i>	32 +	81650	<i>Parametricnemus sp</i>	187
11250	<i>Centroptilum sp (w/o hindwing pads)</i>	+	81690	<i>Paratrichocladus sp</i>	125
11650	<i>Procloeon sp (w/ hindwing pads)</i>	+	81825	<i>Rheocricotopus (Psilocricotopus) robacki</i>	62
11651	<i>Procloeon sp (w/o hindwing pads)</i>	+	82121	<i>Thienemanniella lobapodema</i>	16
12200	<i>Isonychia sp</i>	1 +	82141	<i>Thienemanniella xena</i>	24
13400	<i>Stenacron sp</i>	+	83840	<i>Microtendipes pedellus group</i>	31
13521	<i>Stenonema femoratum</i>	1 +	83900	<i>Nilothauma sp</i>	31
13590	<i>Maccaffertium vicarium</i>	33 +	84118	<i>Paracladopelma undine</i>	+
14950	<i>Leptophlebia sp or Paraleptophlebia sp</i>	43 +	84210	<i>Paratendipes albimanus or P. duplicatus</i>	+
17200	<i>Caenis sp</i>	120 +	84470	<i>Polypedilum (P.) illinoense</i>	31
18600	<i>Ephemera sp</i>	+	85230	<i>Cladotanytarsus mancus group</i>	31
18700	<i>Hexagenia sp</i>	+	85500	<i>Paratanytarsus sp</i>	31 +
21200	<i>Calopteryx sp</i>	9 +	85501	<i>Paratanytarsus n.sp I</i>	62
22001	<i>Coenagrionidae</i>	+	85625	<i>Rheotanytarsus sp</i>	94 +
22300	<i>Argia sp</i>	+	85720	<i>Stempellinella fimbriata</i>	32
34130	<i>Acroneuria frisoni</i>	+	85802	<i>Tanytarsus curticornis</i>	94
50301	<i>Chimarra aterrima</i>	3 +	85818	<i>Tanytarsus glabrescens group sp 4</i>	62 +
50315	<i>Chimarra obscura</i>	48 +	85821	<i>Tanytarsus glabrescens group sp 7</i>	718
51400	<i>Nyctiophylax sp</i>	+	85840	<i>Tanytarsus sepp</i>	187 +
51600	<i>Polycentropus sp</i>	+	86100	<i>Chrysops sp</i>	+
52200	<i>Cheumatopsyche sp</i>	69 +	87540	<i>Hemerodromia sp</i>	48 +
52430	<i>Ceratopsyche morosa group</i>	+	95100	<i>Physella sp</i>	2 +
52530	<i>Hydropsyche depravata group</i>	+	96900	<i>Ferrissia sp</i>	8
53800	<i>Hydroptila sp</i>	1	98600	<i>Sphaerium sp</i>	+
55300	<i>Ptilostomis sp</i>	+			
58505	<i>Helicopsyche borealis</i>	+	No. Quantitative Taxa: 48		Total Taxa: 77
63300	<i>Hydroporus sp</i>	1 +	No. Qualitative Taxa: 55		ICI: 52
68025	<i>Ectopria sp</i>	+	Number of Organisms: 3318		Qual EPT: 25
68130	<i>Helichus sp</i>	+			
68700	<i>Dubiraphia sp</i>	+			
69400	<i>Stenelmis sp</i>	3 +			
72700	<i>Anopheles sp</i>	+			
74501	<i>Ceratopogonidae</i>	24			
77120	<i>Ablabesmyia mallochi</i>	+			
77500	<i>Conchapelopia sp</i>	31			

References

Ohio Environmental Protection Agency. 1987a. Biological Criteria for the Protection of Aquatic Life: Volume I. The role of biological data in water quality assessment. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

_____. 1987b. Biological Criteria for the Protection of Aquatic Life: Volume II. Users manual for biological field assessment of Ohio surface waters. Division of Water Quality Monitoring and Assessment, Surface Water Section, Columbus, Ohio.

_____. 1989a. Addendum to Biological Criteria for the Protection of Aquatic Life: Volume II. Users manual for biological field assessment of Ohio surface waters. Division of Water Quality Planning and Assessment, Surface Water Section, Columbus, Ohio.

_____. 1989b. Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Division of Water Quality Planning and Assessment, Columbus, Ohio.

_____. 2006a. 2006 Updates to Biological Criteria for the Protection of Aquatic Life: Volume I and Volume II Addendum. Users manual for biological field assessment of Ohio surface waters. Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.

_____. 2006b. 2006 updates to Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.

_____. 2006c. Methods for assessing habitat in flowing waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio Technical Bulletin, EAS/2006-06-1. Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.

Rankin, E.T. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, methods, and application. Div. Water Qual. Plan. & Assess., Ecol. Assess. Sect., Columbus, Ohio.